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Original Articles

ARTIFICIAL RESPIRATION IN ITS PHYSIOLOGIC ASPECTS.*

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EDINBURGH.

In order to estimate the value of any method of artificial respiration it is necessary to bear in mind certain general principles and to determine with some approach to accuracy certain statistics.

The most important of the principles concerned is the elasticity of the lungs and thorax, by virtue of which alterations in volume caused by distortion of shape under the influence of an external force are followed, on removal of the distorting force, by a return to the original volume. It is by virtue of this principle that expiration is ordinarily effected, the distorting force usually acting so as to increase the capacity of the thorax by raising the ribs and depressing the diaphragm; on its removal these parts return to their original position. But, artificially, the distorting force can be made to act in an opposite manner, viz., by diminishing the capacity of the thorax and thereby forcing air out of the lungs; on now removing the distorting force the elasticity of the thoracic wall causes air to pass into the lungs and inspiration becomes produced.

The possibility of effecting artificial respiration in this reversed manner, using pressure as the active agent to cause expiration and the elasticity of the thoracic wall to produce inspiration, was demonstrated by Dr. B. Howard of New York, who in 1868 published an account of a method of performing artificial respiration which has since been largely used by physicians and surgeons in threatened death from asphyxia or from administration of anesthetics; this method was introduced by Dr. Howard for employment in cases of drowning. The method consists in laying the patient on his back, kneeling over the lower part of the body, and alternately pressing on the lower part of the chest and relaxing the pressure, repeating the operation eight to ten times a minute. The advantage of the method is that it is simple and that the patient on the operating table is usually in the supine position. The disadvantages are: that the tongue is apt to fall backward and block the pharynx, therefore, needing to be drawn forward; that the ribs in senile subjects are brittle and may be fractured; and that the liver in asphyxia is congested and greatly enlarged and is liable to be ruptured; this is especially the case in drowned subjects.

Another common method of performing artificial respiration—that suggested by Silvester—appears at first sight to be more truly physiologic, since it attempts to imitate natural respiration by raising the ribs and thus increasing the capacity of the thorax. This is effected by forcibly drawing the arms upward toward the head; the muscles passing from the arms to the chest wall, which are attached to the ribs, are thus made to drag the ribs upward. Expiration is effected by lowering the arms and pressing them against the sides of the thorax. At least three persons are needed to operate by this method, one to activate the arms, another to hold the tongue out from the mouth—for the patient is in the supine position—and a third to hold down the trunk and prevent its being bodily moved. Silvester's method was described by him in 1858.

Marshall Hall's method, which was published in 1857, consists in rolling the patient alternately from the lateral to the prone position and pressing on the back between the shoulder blades when in the latter position. Its efficacy was supposed by Marshall Hall to depend on the change of posture, which, by altering the pressure on the chest in the successive positions of the body, alters its capacity; he accordingly termed it the postural method. It has the advantage over the other two methods that the tongue does not require to be drawn out of the mouth by a special operator, and that, in cases of drowning, water and mucus tend naturally to flow out and do not accumulate at the back of the throat, as is the case when the patient is in the supine position.

In 1890 the Royal Medical and Chirurgical Society of London appointed a committee to investigate the efficacy of these and other methods of performing artificial respiration, and of this committee I was made chairman. A large number of experiments were performed on the cadaver, which were mostly futile by reason of the difficulties presented by postmortem rigidity. Subsequently transferring the work to Edinburgh, we made similar investigations on the living passive subject, and also investigated in dogs both the physiologic phenomena presented in drowning and the best means of producing recovery in these animals by artificial respiration. In this research I received the aid of Dr. P. T. Herring of the physiology department of the University of Edinburgh and of my other assistants there.

As the outcome of this work we concluded that, for the performance of artificial respiration without the aid of bellows or other apparatus, a pressure method is best, and that such a method is most efficient with the patient in the prone position and with the pressure applied vertically over the lowest ribs. In this way not only is the thorax compressed, but also the abdomen, against the ground. The pressure on the abdomen forces the viscera against the diaphragm, which is thereby itself moved upward, driving air out of the lungs. On relaxing the pressure the elasticity of the parts causes them to resume their former shape and

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

volume, and air is drawn in through the glottis. The pressure is exerted gradually and slowly, occupying some three seconds; it is then removed during two seconds and again applied; and so on some twelve times a minute. To this method I have given the name of the "prone pressure method." The method is illustrated by the appended cut (Figs. 1 and 2), which are from photographs taken for the Royal Life Saving Society.

In performing it the operator kneels or squats by the side of or across the patient, places his hands over the lowest ribs and swings his body forward and backward so as to allow his weight alternately to fall vertically on the wrists and to be removed; in this way hardly any muscular exertion is required. The efficiency of a pressure method of artificial respiration depends on the fact that after an ordinary expiration the thorax still contains some 1,500 c.c. of air which can be expelled by a forced expiratory effort; this is the reserve or supplementary air of Hutchinson. It is easy to conceive that one-third of this reserve air, i. e., 500 c.c., can be forced out from the chest by pressure, and, as a matter of fact, considerably more than that amount can be expelled when the pressure is applied in the prone position as just described. By repeating the movements—pressure and relaxation—twelve times a minute, we easily get an air exchange of 6,000 c.c., which is more than the average normal amount.

It is somewhat curious to find that up to the time of

Fig. 1.—First position of operator and patient for effecting artificial respiration by the "prone pressure method" described by Professor Schäfer. The operator's hands are over the lowest ribs of the patient.

our investigations no one seems to have tested the efficacy of the current methods of performing artificial respiration by determining the quantity of air per minute which can be pumped into and out of the lungs. Attempts had been made on the cadaver to test the effect of single inspiratory or expiratory movements, but these all proved of little value, for the reason already given. In any case it is of first importance to know what would be the result of keeping up the efforts of artificial respiration during a given time at the normal rate. To this matter we accordingly directed our attention. To measure the amount of air delivered per minute by the several methods above described we employed a spirometer with counterpoise devised by Marcet, so arranged that when the inner cylinder is raised from the water in the outer cylinder its increasing weight is *pari passu* counterbalanced. A mask was fitted over the mouth and nostrils of the subject (or a mouthpiece was used, the nostrils being closed) and a double set of water valves was so arranged in connection with the mask that the air could pass through one valve into the mask and air passages during inspiration and through the other valve into the spirometer during expiration. In this way not only can the amount of air pumped into and out of the chest in a single respiratory movement be measured, but, what is of more importance, the amount which is pumped in and out in a given time—say, one minute or five minutes.

It is known from the experiments of Vierordt that the average amount of air which a man breathes in and out of the lungs per minute is between 5,000 c.c. and 6,000 c.c. If the rate of respiration is twelve per minute, this will give a tidal air volume of nearly 500 c.c. Any method of artificial respiration which fails to provide for an air exchange of less than 5,000 c.c. per minute is therefore less efficient than normal, and a marked deficiency of air exchange should lead us to reject such method. The importance of subjecting all proposed methods of artificial respiration to this test is obvious.

The following figures represent the results of one of a series of comparative experiments made to test the efficacy of the Silvester, Howard, Marshall Hall, and prone pressure methods as compared with natural respiration. Both the subject and operator were the same throughout. In the first place the amount yielded by natural respiration was determined. The rate of respiration was thirteen per minute; the amount of air exchange per minute was 5,850 c.c.; the amount of tidal air works out therefore to 450 c.c. Pumping by the Silvester method at the rate of the natural respiration of the same individual, the amount of air exchange per

Fig. 2.—Second position of operator, who is throwing his weight vertically on his wrists, thus putting pressure on the thorax and abdomen of the patient. This pressure is exerted slowly, occupying some three seconds and is then removed for a period of two seconds and again applied.

minute was 2,280 c.c., giving a tidal air amount of only 175 c.c., which we recognize as quite inadequate.

With the Marshall Hall method the results are similar; an exchange per minute of 3,300 c.c. is registered, giving a tidal air volume of 254 c.c.; also inadequate. With the Howard method the results approach more nearly to the normal; the exchange per minute is 4,030 c.c. and the tidal air volume is therefore 310 c.c., i. e., some two-thirds of what was determined to be the natural amount of exchange in the individual who was the subject of the experiment. On the other hand, by the prone pressure method the amount pumped through the lungs per minute was 6,760 c.c., giving a tidal air volume of 520 c.c. That is to say, this method proves to be completely efficacious and capable of effecting an air exchange greater than that produced in normal respiration.[1]

In cases of drowning there can be no question that the prone pressure method of artificial respiration is

1. The efficacy of the prone pressure method was demonstrated to the Section by measuring the amount of air which could be exchanged in a given time as compared with that exchanged by natural respiration.

always indicated. Its advantages are: 1, That it is fully efficient; 2, that it can be performed without fatigue by a single individual; 3, that it is simple and easily learned; 4, that it allows the tongue to fall forward and the mucus and water to escape from the mouth so that the tendency of these to block the passage of air, which is inherent to the supine position, is altogether obviated. It can be applied equally well in attempting to revive a patient whose respiration has ceased in consequence of an overdose of chloroform or other anesthetic. One of the difficulties and dangers of a general anesthetic is the excessive secretion of saliva and mucus. This, with the subject in the prone position, would tend to flow out of the mouth. With chloroform another source of danger is the tendency of the heart to undergo fatal inhibition, owing to the influence of the drug on the vagus center. Both these dangers are obviated by the hypodermic administration, prior to the operation, of a small dose (1/50 grain) of atropin sulphate. It seems strange that anesthetists do not generally adopt this simple precaution as a routine method. They would thereby be saved much anxiety, and the paragraphs in the newspapers headed "Death During Administration of an Anesthetic" would be much more rare than they are at present.

I have spoken hitherto of methods of artificial respiration which do not require the use of apparatus. Such methods are the only ones which are usually available in cases of drowning, and of these the prone pressure method is certainly as efficacious as any method which involves apparatus. Circumstances, however, may and do arise in surgery in which artificial respiration is called for but which would not permit of the employment either of this or of the other methods above described. In these cases the simplest apparatus which can be employed is an ordinary bellows or a piston cylinder. It is not even necessary to introduce the air directly into the trachea, for, as Horvath observed, if the nozzle of a bellows is introduced into one nostril, the other nostril being left open but the mouth kept shut, it is possible by a vigorous movement of the bellows to distend the lungs quite efficiently, and, by repeating the movement regularly, to carry on artificial respiration. In dogs I have repeatedly obtained recovery after drowning by the employment of this method, in spite of the much greater intricacy and narrowness of the nasal passages in these animals. But in surgical operations which involve the opening of both sides of the chest it would be safer to perform intubation of the larynx, or even temporary tracheotomy. In any case it is highly desirable in such circumstances to adopt, if possible, the prone position for the patient. Under some circumstances a tendency to dyspnea is increased by the supine position. This is the case in dogs with artificial pneumothorax and appears to depend on the position assumed by the heart. Dr. Elsberg recently showed me, at the Rockefeller Institute in New York, an experiment which illustrates this in a striking manner. An animal with a single pneumothorax, which was highly dyspneic when on its back, passed into natural and quiet respiration as soon as it was turned over onto its belly.

Whether for certain surgical procedures it is necessary to carry on artificial respiration by enclosing the body of the patient along with the operators in a chamber within which the air is rarified, it is no part of my function in opening this symposium to consider. We shall doubtless be made acquainted by Professor Sauerbruch with his reasons for adopting this relatively complex method in preference to the simpler positive pressure method which is adopted in physiologic laboratories for similar operations. But there must obviously be a sufficient air exchange whether this be furnished by rhythmic fluctuations in the air pressure of the chamber, permitting the lungs to draw in or drive out air from their cavities, or by a steady stream of air or oxygen passed into and out of the air passages. If this exchange is carried out there is no reason why a method in which respiration depends on the production of expansion of the lung by negative pressure outside it should not be as efficacious as one which depends on positive pressure applied through the air passages. The principle is, in fact, really the same in both cases and in the Sauerbruch chamber, as in natural respiration, it is actually the positive pressure of the atmosphere which produces the lung expansion; the difference between the two methods being that, in the one, pressure on the inside of the alveoli is increased by the action of the bellows, while in the other the pressure on the outside of the alveoli is decreased by the action of the exhaust pump.

ARTIFICIAL INTRAPULMONARY POSITIVE PRESSURE.

EXPERIMENTAL APPLICATIONS IN SURGERY OF THE LUNGS.*

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The ingenuity of Professor Sauerbruch in conceiving the use of negative pressure to prevent collapse of the lung and in constructing his cabinet can not be denied. The size and cost of such an apparatus, however, together with its lack of portability, justifies, I think, investigation and experimentation to obviate the difficulties which have been associated with the use of positive pressure. For we must admit that some simple inexpensive positive pressure device would be more practicable for general use.

My investigations have been exclusively in animal experimentation under the positive pressure method. The objects have been, first, to apply a practical surgical test in animals; second, to refute if possible certain well-known objections to the method; and, third, to improve the application of air compression in order better to maintain ventilation of the lungs and consequent oxygenation of the blood.

The method which I have employed is not the rhythmical inflation method but the use of a steady air compression by the method of Brauer. I first performed thirty thoracic operations on dogs. Wide opening of the right chest was established in all of these cases for periods varying from two to four hours. The air compression was introduced through the apparatus shown in the lantern slides (Figs. 1 and 2). A simple glass face mask was used. Several simple thoracotomies were done with wide openings, and the remainder of the operations consisted in the removal of greater or less portions of the right lung. Of nine deaths in these thirty cases sepsis and the incomplete closure of the lung stump or thorax opening were the chief causes of death. None of the fatalities could justly be attributed to the use of positive pressure. The animals withstood the administration

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

of compressed air without manifesting unfavorable symptoms during the operation, and in the two months' convalescence of the recovered cases no symptoms developed which could be attributed to the use of air compression.

Dr. Sauerbruch, in a paper of 1904, raised as an objection to my method the fear of "interstitial emphysema as a result of the artificial inpumping of air." But here I would emphasize that under regulated introduction of compressed air the sudden blowing up of the collapsed alveoli, such as occurs in rhythmical inflation, is not an existing danger. The air compression must be regarded as a constant factor. Its passage in and out of the lungs should be obstructed only enough to maintain the lung in a state of inflation a trifle below that which is normal to it. If then the lung is never allowed to become collapsed and then suddenly blown up, and if the outer surface of the lung is never hyperinflated beyond the level of the inner thoracic wall, we have no reason to expect a rupture of the alveoli. In fact interstitial emphysema was not found present in any one of the fatalities or recoveries in this series of thirty operations.

We have been told that in the use of positive pressure dangerous changes in the circulation must occur. This objection led me to perform twenty-five blood-pressure experiments. Dogs exclusively were used. Ether anesthesia was employed without previous morphin injection. In twenty of these experiments aortic pressure was recorded from the left carotid. One or both chests were held wide open with rib-spreaders, and in five cases the entire front of the thorax was removed. The air compression was carefully regulated and all exciting traumatic nerve stimulation, such as traction on the lung or undue irritation of the pleura, was avoided as far as possible.

The aortic pressure in these experiments maintained a normal level and the heart action was not disturbed. But inasmuch as changes in the pulmonary circulation might be present and not manifest in the aortic tracing, the pulmonary pressure was also recorded in ten experiments. In six of these the right ventricular pressure was obtained through a glass sound passed through the right jugular vein entering the tricuspid valve. In two experiments pulmonary pressure was obtained directly from the branch to the left lower lobe, and in two instances both methods were used synchronously.

These pulmonary tracings likewise demonstrated that under regulated ventilation changes in blood pressure did not occur. If, however, the air compression was employed several minutes previous to the opening of the chest, a rise in blood pressure occurred which immediately fell to the normal level at the moment of opening. Moreover, if after the opening of the chest the positive pressure was allowed to exceed the limit necessary to overcome the elasticity of the lungs and to preserve oxygenation, changes in aortic and pulmonary pressure were manifest. Lowering the air pressure below the normal limits would cause a fall in blood pressure because of the dyspneic effect of insufficient lung ventilation.

From this series of experiments I conclude that in the presence of wide-open pneumothorax, under properly-adjusted air compression, changes in aortic and pulmonary blood pressure do not occur. Furthermore, in the absence of change in pulmonary pressure I am further persuaded to agree with Professor Brauer that the intra-alveolar tension is no greater when produced by positive inflation than when caused by negative suction applied to the outer surface of the lung.

Fig. 1.—During the removal of a positive pressure apparatus from the face, head, or pharynx, in case of vomiting or ether spasm, the application of a thorax cup as shown converts an open pneumothorax into a closed one and the normal physiologic conditions are more nearly maintained. This cup should be applied at the end of expiration, and thus at inspiration a partial negative intrathoracic pressure is produced. No suction need be applied to cup.

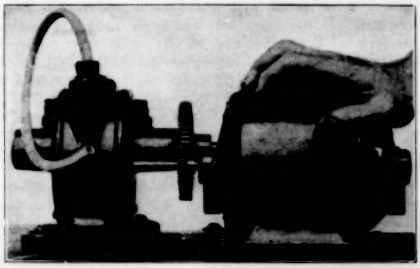

Fig. 2.—This rotary air pump run by a 1/6 horse-power motor supplies a steady air compression with ample cubical volume of afferent air. Its work can be regulated by adjusting the speed of the motor. The use of tanks is thus avoided and it is in other respects preferable to any of the forms of hand or motor bicycle pumps. Its portability is of advantage.

Some observers who have seen Professor Brauer's head chamber clinically applied in surgery of the human, state that cyanosis and dyspnea have been conspicuous factors. In such instances one or two avoidable conditions are present. If unnecessarily high pressure is employed, under-compression of the pulmonary capillaries ensues, the right heart may become engorged and a rise in pulmonary pressure occurs. This should not occur, however, except in the hands of unskilled operators. The more frequent cause of dyspnea in these cases is incomplete ventilation of the lung alveoli due sometimes to the insufficient supply of oxygen, but more often to the stagnation of carbon dioxid, the escape of which is not adequately provided for either in the construction of the apparatus or in its manipulation.

When double wide-open pneumothorax exists, the respiratory excursion of the lung is practically *nil*, with the exception of the slight expiratory effect in the rise of the diaphragm. In other words, the alveoli become dead spaces held in a given degree of steady inflation by air compression. The exchange of gases in these

alveolar spaces is essential but difficult in the absence of the help of the thoracic excursion. A limited dead space is, as has been stated by Yandell Henderson, essential for the retention of the required amount of carbon dioxid.

My experience has been, however, that in the use of a positive pressure apparatus the tendency is to the over-retention of CO_2 from an excessive dead space resulting in excess of CO_2, slowing of the pulse and dyspneic respiration, rather than a tendency to lack of CO_2 (acapnia), cardiac tetanus, and apnea, described by Henderson as the symptoms of hyperventilation.

I have done six experiments by the method of Volhard and Sollman introducing oxygen by catheter through a tracheotomy wound to the bifurcation of the bronchi, with both chests wide open and lungs collapsed.

The alveoli of a two-thirds collapsed lung can thus be ventilated and the animal kept alive. Not only is a direct access of oxygen to the partially collapsed alveoli thus established, but a ready escape and flushing out of carbon dioxid is also provided through the tracheotomy wound around the catheter. In one of two attempts I found it possible to maintain oxygenation by similarly introducing air and ether mixture by tracheal catheter, with both chests opened and both lungs collapsed.

The secret of the success of these tracheal experiments with semi-collapsed lungs is the absolute prevention of a dead space for carbon dioxid retention. In order to avoid tracheotomy and introduce air by the mouth, the lungs must be kept inflated by resisting the outflow of the air compression. The aërating surface is thus increased and the ventilating air is kept in motion as in the tracheal experiments.

I have also observed that when the lungs are held in expansion by a strong resistance to the escape, together with a low supply of air compression, that dyspneic signs of incomplete ventilation come on, and from these observations I have been led to attempt every possible means of improving the gas exchange in the alveoli and thus preventing an absolute dead space. I have, therefore, increased the pressure and rapidity of flow of the afferent "fresh air" by using higher compression, up to about three pounds, yielding a cubic foot of air each minute.

The resistance to the efferent air I have correspondingly diminished so that the lung inflation has remained at its original level. This profuse flushing out of the alveoli is, therefore, a principle which I recommend to prevent the over-accumulation of carbon dioxid, and since its employment I have seen no tendency to dyspnea or cyanosis.

SUMMARY.

The results of thirty operations under positive pressure with 70 per cent. recoveries were encouraging.

Thirty operations and twenty-five experiments proved that emphysema and circulatory changes do not occur with a properly regulated apparatus.

In the use of positive pressure the escape of deoxygenated air must be amply provided for.

I would express my thanks to Prof. Walter B. Cannon for valuable suggestions in the blood-pressure experiments; and to George Adams Leland, Jr. (Harvard Medical School, Class of 1911), for his able assistance.

THE POSITIVE PRESSURE METHOD OF ARTIFICIAL RESPIRATION

WITH ITS EXPERIMENTAL APPLICATION TO THE SURGERY OF THE THORACIC ESOPHAGUS.*

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It is not the intention in this paper to go over the history or to cover the literature of artificial respiration. There are two distinct procedures included in the term. The first applies to postural methods, the second applies to that produced by apparatus. The latter is used in the surgery of the chest. This may again be divided into the positive pressure and the negative pressure methods. It makes little difference which of these is employed. It is in accordance with obvious surgical principles to apply the most expedient.

Matas,[1] Brauer,[2] Tuffier,[3] F. T. Murphy,[4] H. H. Janeway and others have employed positive pressure. Sauerbruch[5] has been the chief advocate of negative pressure. Woillez,[6] in 1876, also employed a negative-

Fig. 1. Result of sectioning operation using silk sutures to make the anastomosis: 1, point of anastomosis which was sequestrated in the abdominal cavity below diaphragm 3; 2, the normal esophago-gastric opening closed with silk sutures.

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. Matas, R.: Tr. South. Surg. and Gynec. Assn., xii, 52-82; Artificial Respiration by Direct Intra-Laryngeal Intubation, Am. Med., Jan. 18, 1902.

2. Brauer, L.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1904, xiii, 496.

3. Tuffier, T.: l'Ouverture de la plèvre sans pneumothorax, Presse méd., Jan. 27, 1906.

4. Boston Med. and Surg. Jour., April 13, 1905, cliii, No. 15, pp. 428-431.

5. Sauerbruch, F.: Mitt a d. Grenzgeb. d. Med. u. Chir., 1904, xiii, 460-480; München. med. Wchnschr., Jan. 2, 1906; Zentribl. f. Chir., 1905, xxxii, 82; Beitr. z. klin. Chir., 1905, xlvi, 405-494. Stetten, DeWitt: The Experiments of Sauerbruch in the Field of Esophageal Surgery, New York Med. Jour., June 10, 1905.

6. Bull. de l'Acad. de méd., series 2, 1876, v., 613.

pressure box. Its application was, however, different from that of the Sauerbruch chamber.

As the technic of intrathoracic work shall improve, and as the underlying difficulties shall be more thoroughly understood, artificial respiration as an aid will become more general. The possibility of intervention in thoracic visceral disease has been made clear by Tuffier, Maffei[7] and others. Dr. Sauerbruch's classic work has given a new impetus to the interest in surgical intervention in the chest.

There are difficulties in the surgery of the chest that are not present elsewhere. The chest is a more or less rigid cavity in which the viscera lie deeply anchored. The condition of negative pressure exists. The walls remain rigidly outstanding after either partial collapse of the lung or the removal of part of the enclosed viscera. This latter causes a failure of the viscera to fill the chest at once completely after it has been opened.

There is an apparent tardiness in the serous membranes of the chest to form rapid and plastic adhesions as compared with the peritoneum. Whether this is real or only due to the other conditions within the thorax has not yet been worked out. As to the fibrous adhesions, it is well known that they may be very extensive. In other words, speaking surgically rather than histologically, there are two degrees of adhesions: the first is the plastic form, the second is the fibrous or organized. The rapid development of the first-mentioned is the element which makes a large part of the intra-abdominal work possible. The rate of formation of plastic adhesions within the chest is apparently slower. There is a marked susceptibility of the pleural cavity to infection.

Fig. 2. Side-tracking operation by means of a Murphy button: 1, is on the edge of the normal esophageal opening; 2, is on the edge of the new stoma; 3, is the diaphragm; 4, is the Murphy button impacted in the pyloric end of the stomach, causing death two weeks after operation.

After operations in the chest, as elsewhere, septic manifestations may occur. When these have once occurred, it is very hard to establish drainage. This has been our experience in the Research Laboratory. Infection, when present on one side, may rapidly involve the other. We have found in dogs that opening one side of the chest usually means collapse of the lung on the other side as well, unless the lungs are kept inflated by some artificial means, and frequently we have found a communication of one pleural cavity with that of the opposite side. Prof. George S. Huntington regards these openings as artifacts. Furthermore, even if not patent, the mediastinum in dogs is very thin and easily movable, and does not offer the resistance to atmospheric pressure, when one side is opened, that is found in the human being. On this account it would seem that operations for certain conditions in the human subject will prove more successful than the same class of operations for experimental purposes in dogs. This may seem an extraordinary statement, as it is the popular belief that dogs are more resistant to septic infection than are human beings. Our researches, however, have shown that dogs are not as resistant to infection as is commonly believed. In operations in the chest we may get infection from the skin, the severed bronchial tubes, or the opened hollow viscera. Operations on the lungs appear to be less frequently followed by empyema than operations on the alimentary canal. In work on the lungs it is important to have all the cut ends of the bronchial tubes closed in to prevent it. Any method that accomplishes this well should succeed. In a recent article by Samuel Robinson,[8] of Boston, very good results have been reported. In a previous paper,[9] one of us has outlined a technic for the prevention of sepsis from the bronchi. In work on the esophagus, sepsis more frequently follows, unless special points in technic applicable to the chest are carefully observed. Whether this is due to the aspirating of air down the esophagus

Fig. 3. Side-tracking operation by means of a Murphy button containing an obturator in the male portion: 1, normal esophageal opening into stomach; 2, new stoma; 3, diaphragm. (It must be understood that in these operations the cardiac portion of the stomach was drawn up through the diaphragm into the chest and became thereafter an adventitious thoracic viscus.)

7. Jour. de Chir. et Annal. de la Soc. belge de Chir., 1906, vi, 380-390.

8. Ann. Surg., February, 1908, xlvii, No. 2.

9. Green, N. W.: Surg., Gynec. and Obst., May, 1906, ii, No. 5, 512-538.

while it is opened, thus contaminating the field of operation, or whether it is due to subsequent leakage from some mechanically imperfect closure is hard to determine. It may be from both. H. H. Janeway has suggested that it may, in some degree, be due to the suction of the negative pressure aiding intra-thoracic seepage along the stitches, or retrograde leakage between them.

Dr. Sauerbruch has had very favorable results with the aid of some mechanical device such as the Murphy button. We think that this is due to a more perfect closure of the anastomosis wound and of the lymphatics than can be made by stitches, for when properly applied it makes a tight apposition of the visceral surfaces.

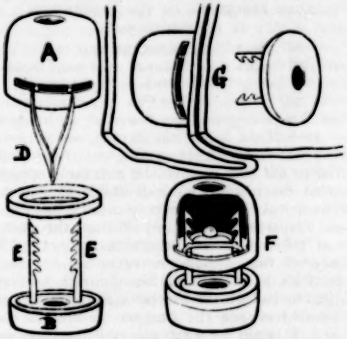

Fig. 4. Special button for esophago-gastric anastomosis (side-tracking operation): A, gastric half of button; B, esophageal half; C, floating ring (elastic) for maintaining continuous pressure on tissues (this is made now as a spring ring); D, forceps for releasing spring which engages needles, E, E; F, complete button partially closed; G, method of uniting halves of button by perforating walls of esophagus and stomach by the needles (the portion of the walls thus included between the halves of the button undergoes necrosis from pressure and sloughs out in a few days). The new stoma shown in Fig. 6 is the result of such a process.

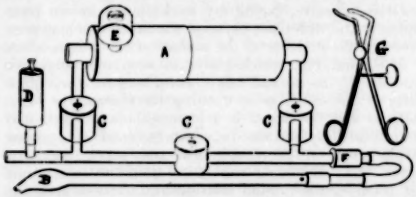

Fig. 5. Apparatus for applying positive pressure in artificial respiration; A, ether chamber filled with gauze; B, intubation tube; C, C, C, valves used to direct current of air either through ether-chamber or directly to intubation cannula; D, safety valve; E, inlet for fresh ether; F, air-filter; G, clamp for holding tube in place.

This, unlike the union made by stitches, is an uninterrupted pressure circle. That made by stitches, on the other hand, even if they be continuous, must have points of varying pressure throughout its circumference. These theoretical points have been suggested to us by the difference in mortality in practically comparing the two methods. Our own experience leads us to believe that some mechanical device which will establish an anastomosis with absolutely no soiling of the serous membrane, forming at the same time a tight joint, will prove of the greatest assistance in rendering operations of this nature free from disastrous infection. Dead spaces within the chest should be overcome as much as possible, at the termination of the operation by increased air pressure. The absence of omentum with its coapting power is an unfavorable feature which may hinder success. We have carried omentum into the chest and applied it to the wound in one instance. The constant motion of the diaphragm may be a factor which militates against proper union after operation. We have stretched the diaphragm on the operated side, and also interrupted the function of the phrenic nerve in an effort to overcome this.

The difficulty of establishing drainage may, in part, be overcome in the human by some sort of aspirating device.[10] In our experimental work on dogs this is hardly applicable.

Fig. 6. Stomach removed from dog ten days after operation: 1, 1, glass rod passing through esophagus and normal cardiac orifice of stomach; 2, new stoma made by button shown in Fig. 4; 3, diaphragm.

The indications for operation on the esophagus are: stricture of the esophagus, carcinoma of the lower end or of the esophago-gastric juncture, diverticulum of the esophagus, and foreign bodies within the esophagus.

The operations that we have undertaken in the Surgical Research Laboratory on the esophagus may be classified under two types. In one, the esophagus was sectioned, reuniting the proximal end with the cardia of the stomach (Fig. 1). In the other, there was a side-tracking of the cardiac orifice similar to the method of Biondi.[11] The sectioning operation was done with

10. Seidel, H.: Deutsch. med. Wchnschr. Feb. 22, 1906. Bryant, J. D.: Surg., Gynec. and Obst., 1906, iii, 296-302.
11. Gosset, A.: Rev. de Chir., 1903, xxviii, 604.

the aid of sutures and of the Murphy button. The results have not been encouraging. The greater amount of traumatism and the more protracted duration, together with the difficulty of making a perfect closure, have limited our success. The side-tracking method has been accomplished with the aid of the twine triangular stitch elaborated in this laboratory,[12] and with the aid of the Murphy button (Figs. 2 and 3). We have also made use of a special button (Fig. 4) designed (by N. W. G.) with the idea of causing an anastomosis with no further opening of the viscera at the time of operation than two needle-like punctures made after the serous surfaces have been coapted.

We have used during these procedures an apparatus for artificial respiration described in previous communications.[13]

It may be well here to present a diagram of it (Fig. 5). Ether has always been the anesthetic used. The loss of body heat was always considerable, but this, in part, has been overcome by warming the ether vapor before sending it into the air-passages.

It may be of interest here to describe in detail one type of procedure which has seemed to us particularly satisfactory. The animal was first placed under ether and the intralaryngeal canula inserted and held in place by a clamp, pinching the tube just oral to the hyoid bone. Through the mouth were introduced, first into the stomach and then into the esophagus, the halves of the button shown in the diagram. The esophageal portion, being the one with the needles attached, was introduced and guarded by a long alligator-jaw forceps. This was left in place while the chest was opened at the level of the eighth rib on the left side. The eighth rib was removed, stripping from it its periosteum, as suggested by Janeway. This gives a much better opening than the intercostal incision and makes it far easier to close the chest at the completion of the operation. The amount of air introduced was regulated by direct inspection of the lung. The seventh and ninth ribs were pressed apart by a self-retaining retractor and care was taken to protect the wound from contamination by a suitable covering. The diaphragm was opened in its tendinous aponeurosis, and the cardiac portion of the stomach drawn up through the opening into the chest and sutured in place to the edges of the diaphragmatic wound. This suture was a continuous one and several reefing stitches were taken in the stomach to one in the diaphragm. This close stitching of the stomach was found to be necessary on account of the tendency of the abdominal viscera to cause fatal prolapse into the chest. We were careful not to include the blood vessels of the stomach in our sutures. Feeling through the stomach wall, we grasped the first portion of the button, previously introduced, and drew it through the new diaphragmatic opening into this cul-de-sac. The forceps were then removed from the esophageal half, the surfaces of the stomach and esophagus brought in apposition and the two halves of the button pressed tightly together. They were held by the spring which engages the serrations at the side of the needles. This completed the intrathoracic part. The chest wall was then closed in layers. The operation here described consumed fifty-five minutes. At the end of ten days the dog was given a lethal dose of ether. The stoma shown in the photograph was found present (Fig. 6).

We wish to express our appreciation to Mr. Arthur G. Sullivan for his assistance, to Drs. H. H. Janeway and N. B. Leggett for many valuable suggestions and to Dr. Robert M. Brown for his skillful mounting of the specimens.

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12. Maury, J. W. Draper.: Studies from the Laboratory for Surgical Research, Columbia University, 1907, i.

13. Green, N. W., and Maury, J. W. Draper.: Ann. Surg., Oct., 1907, xlvi, 544-548.

PRESENT STATUS OF SURGERY OF THE THORAX

AND THE VALUE OF THE SAUERBRUCH NEGATIVE PRESSURE PROCEDURE IN THE PREVENTION OF PNEUMOTHORAX.*

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GERMANY.

When I was accorded the honor of an invitation to deliver an address before the Section on Surgery and Anatomy, of the American Medical Association, it occurred to me that it would be a suitable opportunity to present the modern methods employed for opening the thoracic cavity and to give you the results of many personal experiences obtained during the past four years in the use of my pneumatic cabinet. The inefficiency of the methods in vogue up to that time prompted me at the solicitation of my then chief, von Mikulicz, to endeavor to devise a method of operation which would obviate the dangers incident to thoracic surgery. I began by analyzing the methods used to prevent the occurrence of pneumothorax, especially the method of artificial respiration which had been used extensively and successfully in animal experiments for more than a hundred years, and, more recently, in an improved manner, by Matas and several others in the human being. I soon became convinced that this method possessed too many disadvantages ever to become practical. That led me to experiment with negative pressure, basing my work on the known principles of the difference between the intrabronchial pressure and the pressure at the surface of the pleura, about 7 to 8 mm. Hg, which serves to keep the lungs distended. If the normal relationship between these pressures is disturbed, as by opening the thorax, the lungs collapse and the result is a pneumothorax, which may be followed by serious disturbances, such as dyspnea, displacement of the diaphragm and heart, vagus reflexes, etc. Believing that these complications would not occur if the normal relationship of these pressures could be maintained, I was led to carry out the following experiments: The ends of a glass cylinder were sealed with gutta percha paper. One end was perforated by three openings, two small ones, and one large one; the opposite end was perforated by a single large opening. The animal was placed in the cylinder, so that the head protruded from one of the large openings, and the legs and lower part of the body through the other opening. I passed my hands in through the small openings, endeavoring to keep the cylinder airtight. Next, the cylinder was exhausted sufficiently to reduce the air pressure 10 mm. Hg; then I opened

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the thorax—and the lungs did not collapse, nor was the respiration disturbed in any way. This primitive apparatus was replaced by a better and a larger one, and then by a small operating room, in which I performed a number of intrathoracic operations, such as resection of the lung and esophagus and operations on the heart, and always with the same result, total absence of pneumothorax.

The result of these experiments was the building of an operating room for practical use. The first operation done in it (resection of esophagus) proved positively that the results obtained in animal experimentation could be duplicated in the case of the human being —that pneumothorax could be prevented.

Soon afterward Brauer published results obtained with a modification of my procedure, the so-called plus or positive pressure, which has not as wide a range of applicability as has my method, although the improvements that have been made in the apparatus used by Brauer have also increased the advantages of the method.

Having established the correctness of the principle of my method, it became necessary to elaborate the operative technic, by no means a small task. Von Mikulicz, Kuettner, Meyer, Tiegel, Seidel, and Freidrich participated in this work, and the result has been eminently satisfactory. Definite rules have been laid down for certain operations, which I will endeavor to explain to you. So far as the anesthetic is concerned, it is remarkable how small a quantity is necessary to produce complete anesthesia, and then only at the time of opening and closing the thoracic cavity. During the remaining steps of the operation very little of the anesthetic is required. It has been shown that it is unwise to reduce the pressure more than 7 to 8 mm. Hg, and Friedrich has had excellent results with a negative pressure of 3 to 5 mm.; in fact, such a minimum reduction should always be employed during intrathoracic operations, as on the esophagus or lungs, or when it becomes necessary to expose the mediastinum. Before concluding the operation, however, it is essential to raise the pressure to 7 or 8 mm. Hg, so that the lungs may become fully expanded, filling the chest cavity completely. Needless to say, the strictest asepsis must be observed, as in abdominal operations, and complete hemostasis is of the greatest importance, especially when entering the thoracic cavity, so that as little blood as possible will enter.

As to the indications for this method: It was particularly desirable to employ it in the removal of large tumors of the chest wall. Numerous attempts have been made to remove such tumors, especially sarcomata of the ribs, involving the lungs and pleura. Previously, tamponade and drawing the lungs forward into the wound were resorted to, in order to prevent the occurrence of pneumothorax; and, while these measures proved successful in some cases, they are not entirely satisfactory, and serious complications, even death, following these procedures are not unknown.

The first case operated on in the pneumatic cabinet under negative pressure was one of sarcoma of the ribs. No disturbance whatever followed the extensive opening of the thorax; the field of operation was exposed freely, showing the advantages of the procedure in cases where such extensive resection of the chest wall is necessary. Soon afterward I had an opportunity to operate in a case of extensive mammary carcinoma involving the chest wall. The case was considered inoperable, because several ribs and much of the soft parts would have to be removed to give even a reasonable hope of securing some slight measure of success. The defect caused by the removal of the tumor was so great as to necessitate a plastic operation. In accordance with the usual procedure in such cases, I transplanted the healthy breast to the site of the one that had been removed, placing it directly over the lung, which filled in the defect very nicely. The flaps were sutured to the surrounding soft tissues by means of a two-tier suture. The result was a complete success. The operation was repeated, with equal success, in a number of other instances, and similar results were obtained by Haecker and Kuettner, at the Breslau Clinic.

Practical experience in ten cases has shown that the dangers of these operations, especially from involvement of the pleura, are lessened greatly, and that the contraindications for the employment of more radical procedures are fewer than before; involvement of the ribs and pleura in mammary carcinoma is no longer a contraindication for operation. It is also possible to operate more extensively and with better results in pulmonary emphysema and tuberculosis, and in performing cardiolysis, although every effort will be made now as before to avoid injury of the pleura. If, however, in spite of care observed, the pleura is injured, my apparatus will absolutely prevent the occurrence of pneumothorax. The possibilities of the method in lung surgery, especially in the surgical treatment of pulmonary tuberculosis, will constantly become greater, but a final opinion must be withheld for the present and we must not expect too much; in fact, I believe that in such cases thoracoplastic operations or the artificial pneumothorax will yield better results.

Before proceeding to discuss the use of my method in the treatment of diseases of the lungs in general, I wish to speak more particularly of its use in the treatment of empyema, where my results have been excellent. It is important not to be content with the lessening of the size of the opening in the pleura through expansion of the lungs; the operation must be performed under differential pressure. The expansion of the lung forces out the exudate that may be present, and prevents the occurrence of pneumothorax, while shrinkage of the lung, with subsequent scar formation, is lessened considerably. All recent empyemas and a considerable percentage of the chronic ones yield quickly without the formation of a fistula; the patient is spared tedious after-treatment and subsequent plastic procedures.

The operation is performed in the usual manner, with a negative pressure of 7 mm. After evacuation of the pus a gauze dressing is applied without drainage, and a mammoth dressing is put on over all, thus preventing the entrance of air into the pleural cavity. The dressings remains in place until the fifth day, when it is removed and a new one applied in the pneumatic cabinet. The lung is now adherent to the edges of the wound, and the subsequent treatment is that for an infected granulating wound.

The diseases of the lung in which surgical treatment is particularly indicated and successful are gangrene and abscess; in fact, it is in the treatment of these conditions that lung surgery had its inception. When the disease is superficial, the treatment is simpler, and pneumothorax need not be feared. The treatment is the same as for the same conditions elsewhere in the body. It is only when the lesion is central that the operation is of magnitude. An operation performed under negative pressure possesses several advantages.

Aside from the fact that the possibility of pneumothorax is obviated, the anatomic relationship of the parts is more apparent, because of the expansion of the lungs. The diseased portion of the lung is brought into view and the lung is sutured to the edges of the wound. The abscess is opened by means of the galvanocautery. It is here that my method is especially advantageous in that it prevents the aspiration of foreign material into the healthy parts of the lung. The excess pressure in the bronchi prevents gravitation of fluids and forces every particle of free blood to the wound surface, where air-bubbles are seen to burst, driving before them particles of blood and pus. Experiments on animals have proved the correctness of these statements. Even when a large blood vessel has been severed, one which empties itself directly into the lumen of the bronchus, aspiration does not take place. The blood is forced out by the excess pressure.

This fact is also of the greatest importance in the after-treatment, and experience has shown that changes of dressings, at least at the beginning, should be made under differential pressure, not because of pneumothorax, but solely because it tends to remove blood and pus from the bronchi.

As to the bronchiectases: Here we must distinguish between the varieties of this affection. When the lesions are multiple, operative intervention, with the hope of a radical cure, is out of the question, and the same is true of the tuberculous bronchiectases, even when only one lung is involved. Thoracoplasty, with extensive resection of ribs and mobilization of the chest wall, is preferable to intrapleural treatment. At present an operation is indicated in bronchiectasis only when the lesion is isolated in one lobe of the lung. This lobe must be resected.

Two years ago I saw a case of this kind, occurring in a girl 22 years old. The lesion was circumscribed and confined to the lower lobe of the lung. The operation was done under negative pressure. The whole lower lobe was of a deep, dark, bluish-red color, contrasting clearly with the grayish-red color of the remainder of the lung. The diseased portion of lung was of a firm consistency, hard and airless. In these cases the best procedure is resection of an entire lobe, as in the case of tumors.

Primary carcinoma of the lung is exceedingly rare. Only once have I resected a considerable portion of the lung for this affection. The case was a very interesting one. A woman 34 years old had severe pains of about three months' duration in the left side. The pain was radiating in character, paroxysmal, resembling a typical intercostal neuralgia. Pressure on the nerves promptly induced a paroxysm of pain. Inasmuch as the examination failed to disclose any pathologic condition, the patient was treated with the usual remedies, but without securing relief. She was sent to the clinic for nervous diseases at Greifswald, where a diagnosis of intercostal neuralgia was made. At her discharge her condition was the same as before.

She then was referred to the surgical clinic. Her physician informed us that there was a circumscribed area of dulness in her left side, which did not convey the impression of either an exudate or of pneumonia. He suggested a malignant growth. The examination confirmed these findings, and we further succeeded in making an absolute diagnosis of carcinoma of the lung because of the finding of nests of carcinoma cells in the sputum. Failing to find a similar tumor elsewhere in the body, we concluded that this was a case of primary carcinoma of the lung.

An incision, 30 cm. long, was made in the left fourth intercostal space. There were no adhesions between the pleuræ. The tumor involved the left lower lobe, except at its most dependent portion, and in two places extended into the upper lobe. The surface of the tumor was nodular. Two of these nodules, about the size of a small apple, situated in the parietal pleura under the fifth rib, pressed on the intercostal nerve, thus explaining the intercostal neuralgia. At this particular spot the tissues had grown together and there was also some necrosis of the ribs, the result of pressure. I resected extensively the third, fourth and fifth ribs and the attached soft tissues, so as to secure free access to the lung. I was successful in isolating the diseased tissue, but was unable to extirpate because the pleura was firmly adherent to the pericardium and the diaphragm. Only the top of the tumor was removed.

The patient recovered quickly from the operation and was discharged after four weeks. Three months afterward she was still free from pain, but was rather weak.

Operative intervention in bronchiectasis and tumors of the lung should, if possible, consist in amputation of an entire lobe of the lung. Occasional attempts have been made to do this, but the procedure has been discouraged. The main difficulty in such resections is caring for the bronchus afterwards. On it depends the success of the operation. It is rather difficult to suture a bronchus, and if the sutures loosen, air will enter into the mediastinal tissues, producing mediastinal emphysema, a serious complication. Various operators, have called attention to this fact, especially Garrè, Talke, Tiegel and Friedrich. According to the latter, the technic of the operation is as follows: After exposing the bronchus at the hilus, and, if possible, freeing the vessels from it, it is clamped loosely with forceps protected by rubber tubing. The forceps were passed in from before backward. The bronchial mucous membrane is curetted away with a small sharp curette. Three cm. above the opening of the bronchus in the diseased area a ligature is passed around the tube and tied tightly. The proximal clamp is then removed. The lumen of the bronchus will eventually be closed by granulation tissue. If necessary, a second ligature—one of catgut—may be applied proximal to the main ligature, so as to act as a dam to lessen the tension on the main ligature that might be caused by attacks of coughing. The principal ligature, of fairly heavy silk, must be tied securely. The wound in the lung must be easily accessible. The dressings must be changed in the pneumatic cabinet, because in that way only can pneumothorax be prevented. I have seen this accident occur once because this precaution was not taken. The patient died from a suppurative pleurisy. The immediate danger of pneumothorax, while serious, is not to be feared as much as the infection which may occur.

It was to be expected that, as soon as it was possible to obviate the occurrence of operative pneumothorax, surgeons would view the treatment of intrapleural injuries differently. Many surgeons, particularly Tuffier and Garrè, recommended care in the treatment of injuries of the lung, particularly when there was much hemorrhage. The principal reason for this caution was the fear of pneumothorax and infection. Nevertheless, operative procedures proved successful in many

cases of lung injury (Garrè, Tuffier, Grunnet, etc.). I have operated under negative pressure twice for rupture of the lung, and Kuettner performed suture of the lung hilus successfully in two severe cases of injury. He operated solely to check hemorrhage. In my cases the lung was ruptured or torn by fragments of the rib causing a tension pneumothorax. Both patients were highly dyspneic when they came to operation and there was extensive emphysema of the skin in both cases. It was in these cases that I was particularly impressed with the disastrous results following pneumothorax and emphysema of the diaphragm caused by displacement of the heart and the healthy lung. But above all was I impressed with the inefficiency of the previous methods of treatment and the particularly happy results that were to be obtained from operating under negative pressure. As soon as the skin incision was made, I noted that the air contained in the tissues was pouring out into the pneumatic cabinet and very soon all evidence of emphysema had disappeared. When the thoracic cavity was opened, the collapsed lung was seen to be resting on the distended mediastinum, but while we were watching, it began to expand and at the same time the mediastinal emphysema gradually disappeared. The two layers of the pleura again were in contact and the heart action became normal after the air pressure was removed. These observations led me to examine into the clinical history of tension pneumothorax more closely; but of this I will speak at another time.

I wish to mention in this connection that, when operating under negative pressure in these cases of lung injuries, the injured area is easily located. The air is seen to pass out from it in the form of blood-red foam; or the hand may feel the air current as it passes out from the injured area. Of the various methods employed for suturing the lung tissue, I prefer those of Tiegel and Friedrich. It is important to bring the serous surfaces in apposition, as in intestinal suturing. Whether drainage should be employed is a question that I would answer in the negative. My experience has been that it is preferable to close the wound immediately, unless the operation is performed some time after the occurrence of the injury and when infection is present in the pleural cavity.

My method of operating under negative pressure is indicated particularly in operations on the thoracic portion of the esophagus. Heretofore, this has always been a great problem. After many trials and tribulations and much experimental work on animals (in which I had the guidance of von Mikulicz), I succeeded in developing a technic which made it possible, at least in the case of animals, to resect successfully large portions of the esophagus. The essential feature of the method is the avoidance of sutures and the use of the Murphy button to secure anastomosis. Operations which may be and have been employed successfully on human beings are gastro-esophageal anastomoses and resection of the cardia. I have on previous occasions described this operation and have employed it in nine cases. All of the patients died. Similar results were obtained by Tuffier in three cases, Kuettner in two cases, and Wendel in one case of carcinoma of the esophagus. It may seem venturesome for me still to believe in the possibility of resection of the thoracic portion of the esophagus, and yet the repeated observation that the tumor was too large or that it was operated on when already far advanced, or the belief that the technic was at fault, led me to conclude that in favorable cases the operation must prove successful.

A case that pursued the most satisfactory course of any of the esophagus resections was one in which an operation was done last year. A woman 45 years old had a carcinoma of the esophagus about ten cm. in diameter, the upper end extending slightly above the left bronchus. In spite of its position, it was possible to isolate the tumor and not injure the vessels and nerves. I resected that portion of the esophagus, but unfortunately I could not bring the ends together. The upper end was switched off sideways. The patient died on the fifth day from pleurisy and pericarditis. However, the operation itself was technically successful, and I believe will prove entirely successful in suitable cases. The most favorable cases are of carcinoma of the cardia. An examination of twelve thousand dissected cases has shown that this class of tumor is relatively frequent, metastases late, and does not spread rapidly locally. Our operative results thus far have shown that these tumors should be attacked through the thorax and not through the abdomen. If the tumors are small, the end of the esophagus is invaginated into the stomach, and at a second operation the tumor is excised through the stomach. In the case of larger tumors, the tumor is resected and an anastomosis is done between the stomach and esophagus. It is advisable to make this a lateral anastomosis, using the Murphy button, passing the male portion of the button into the esophagus through the mouth by means of a long sound.

The thoracic cavity is opened in this operation in the fifth interspace, with or without resection of the ribs. In order to expose the field of operation as much as possible, the incision is kept open by means of Mikulicz's rib clamp or retractor. The negative pressure during the operation ought not to be higher than three to five mm., being raised to seven or eight mm. toward the end of the operation. After having sutured the periosteum, the skin and fascia are closed by means of tier sutures.

On basis of extensive studies and one experience on the living subject, I have come to the conclusion that in cases of deep-seated carcinoma of the cardia, i. e. cases in which the upper border lies below the diaphragmatic slit, resection of the costal arch, as recommended by Dr. Willy Meyer, of New York, for this purpose four years ago, is a procedure of great practical value.

Surgery of the heart has been advanced the least by this new procedure. The reason for this is that injuries to the heart always occur accidentally and any treatment is done in an emergency. A series of operations on the heart has shown that it is possible to expose the heart freely without opening the pleural cavity, and that the patient usually recovers from pneumothorax when this occurs. But it is probable that surgery of the heart will profit and be advanced by this new method. A year ago I proved experimentally that the use of negative pressure was advantageous in many ways, which I can not mention specifically at this time.

I can not close my remarks on this subject without referring briefly to exploratory thoracotomy. I believe that this is justifiable more often than is thought, because of our shortcomings in the diagnosis of diseases of the thoracic cavity. The same is true of the thorax as of the abdomen; an exploratory laparotomy or an exploratory thoracotomy will often clear up a doubtful case. This is particularly true in the case of foreign bodies in the lung, when the Roentgen ray fails

to make the diagnosis. The operability of esophageal carcinoma may also be determined by thoracotomy when both the Roentgen ray and esophagoscopy have failed. Of course, the incision should not be a large one, and rib resection should not be resorted to. If done quickly and cautiously, the incision is free from danger and will prove valuable in many cases. Only in this way can we hope to make haste slowly.

DISCUSSION

ON PAPERS OF DRS. SCHÄFER, SAUERBRUCH, ROBINSON, GREEN AND MAURY.

DR. GEORGE W. CRILE, Cleveland, Ohio: The ultimate object of artificial respiration is that of affording the fixed tissues, especially the central nervous system, the exchange of gases necessary to life. To accomplish this the circulation and the respiration are equally essential. Air hunger is just as marked in failure of the circulation as in failure of lung ventilation. When the total amount of blood and the vigor of its circulation is above normal less than normal respiratory effort is needed. For the best results in artificial respiration, then, a good circulation is required. In considering artificial respiration one must take into account the effect which alterations in the intrapulmonary pressure exert on the circulation. The blood pressure in the pulmonary capillaries is low. Intrapulmonary pressure is exerted directly on all these capillaries; hence, the entire blood stream is affected. The lower the blood pressure the less intrapulmonary pressure is necessary to block the blood stream. In sheer emergencies there is opportunity for only the simple methods, of which the most effective is the one that supplies a sufficient exchange of air and gives the greatest aid to the circulation. These requirements are fully met by the methods of Professor Schäfer. The thread of life may for a time be unbroken if even a very small amount of oxygen be supplied. When one tries to kill an animal by asphyxiation, one is constantly surprised at the wonderful rejuvenating power of only a slight amount of air. Both experimental and clinical evidence show that the circulation may be remarkably energized by pressure on the thorax and abdomen. In the majority of operative emergencies there are many obstacles opposing the change from the supine to the prone position. I conclude that rapid, rhythmic pressure on the thorax, with the patient lying on the back, when the prone posture is contraindicated, is the simplest and most generally useful emergency method.

As for planned cases of artificial respiration, I would add a strong word of caution against any considerable change in the intrapulmonary pressure. There is scarcely any more certain and sudden method of killing an animal than by an excessive intrapulmonary pressure. Now, the circulation in a normal animal may not be much hampered by a certain amount of increased pulmonary pressure, but in the states of low blood pressure the circulation may unexpectedly collapse. Recent experimental research has proved that the circulation of an animal carefully overtransfused with blood from another animal becomes stable and the blood pressure is raised. Changes in intrapulmonary pressure affect the circulation far less, and such an overtransfused animal endures intrathoracic pressure far better. When there is an increased volume of blood and increased circulatory vigor, the respiratory movements diminish. Conversely, when there is a failing circulation, respiratory movements become increased. In planning a hazardous chest operation, if the heart is normal, the chances for a successful issue seem to be greatly increased by first rendering the circulation stable. There are a number of methods whereby a sufficient amount of oxygen may be supplied, but there are few methods that do not in the case of weak circulation threaten the circulatory stability. On the whole, the problem of supplying the required amount of oxygen *per se* is not difficult. The real difficulty is met in providing lung ventilation without interfering with a weakened circulation.

DR. WILLY MEYER, New York: Surgical pneumothorax has, up to date, been the principal barrier to further advance in intrathoracic surgery, and that up to a time when abdominal surgery has had its triumphs the world over. Dr. Fell of Buffalo devised and Dr. O'Dwyer improved the apparatus for intubation, and Dr. Matas has further improved it, adding an arrangement for general anesthesia. But tracheotomy or intubation is not what we surgeons want for practical purposes. Tracheotomy means a grave addition to the surgical trauma, especially for older patients, and an intubation apparatus is unreliable for cases of retching and vomiting. Besides, the accumulating intrabronchial secretions can not be expectorated. Even rectal anesthesia would probably not overcome this trouble.

What is essential for good surgical work is that the narcotizer should have free access to the patient's head, especially the mouth, at all times. He must be able to turn the patient's head to one side, and clean out his throat just as thoroughly and easily as he is accustomed to doing this during other operations.

In 1893 the late Professor von Mickulicz charged his assistant, Dr. F. Sauerbruch—to-day our guest—to find a more practical procedure in order to overcome the dangers of pneumothorax. This he accomplished by constructing an operating cabinet, within which he has done, five operations on the human subject, and a great many on animals. The beauty of this cabinet is that it can be used for negative as well as for positive pressure. If the operation with negative pressure is desired, the patient's head is placed outside of the cabinet and the body inside; if positive pressure is desired, the head is placed inside and the body outside.

In either case the anesthetizer has free access to the patient's head. If he is inside of the cabinet and positive pressure is used, the excellent ventilation provided for will prevent his becoming anesthetized himself. The same suction pump, arranged with a T tube, provides for negative and positive pressure. This cabinet allows of free intrathoracic operating with impunity. Simultaneously with Sauerbruch, though independently, Professor Brauer of Marburg, in 1904, designed an apparatus for positive pressure which though since improved, labors under the same drawbacks as all other devices for positive pressure, namely, that any accidents, occurring in the course of the anesthesia, can not be met properly.

The drawbacks to a more general use of Sauerbruch's cabinet thus far have been its cost and its size. In its present shape, however, it is much less expensive (about one-third of its original price) and, to cheapen it still more, Dr. Sauerbruch has planned to have one made of canvas, properly painted. He also intends to have a small cabinet placed on castors so that it can be wheeled to the patient's bedside, should it become necessary to change the first dressing under pressure difference. Sauerbruch has solved the problem in either direction. It now remains for us surgeons to adopt and try the procedure.

We all know that esophageal cancer is the least malignant of all the types of carcinoma, including the colonic. And yet, what do surgeons do in these cases up to the present time? They perform gastrostomy or dilate the stricture as long as this can be done, and then let the patients die. This must be changed. In resecting the esophagus by the intrathoracic route, or in attacking a cardial cancer from the abdomen with the help of osteoplastic resection of the costal arch, we must be prepared for opening the pleural cavity. The abdominal operation also must, therefore, be done under differential pressure. The greater majority will, as a matter of course, be done by the intrathoracic route. Professor Sauerbruch has greatly improved the operative technic. He closes the proximal cut end of the esophagus by infolding, and after having pulled the stomach into the thorax—and this for the reason that the esophagus can not be stretched—does esophago-gastrostomy by means of Murphy's button introduced on a long forceps or stiff bougie by way of the mouth. Care must be taken to have the stem of the button penetrate also the pleura in order that this serous membrane may be pressed against the peritoneal covering of the stomach within the grasp of the button. The latter has of late been improved for this operation at the research laboratory of the College

of Physicians and Surgeons of New York. Professor Sauerbruch, in this way, saved twelve out of thirteen dogs experimentally operated on; surely an excellent showing. The nine human beings operated on by him in the same way were afflicted with malignant esophageal stricture. All died, but every one of the patients was in a decrepit condition when the operation was undertaken, and death was not due to any defect in the method of differential pressure in a single instance. There can be no doubt that if we operate early the results will be correspondingly better. Surgeons should work together toward this end. We must succeed in doing intrathoracic resection of the esophagus for carcinoma under negative or positive pressure and save the patient in early cases as long as the lymphatic glands are not involved. If such involvement has occurred, resection is useless, as it indicates that the growth passes the borderlines of the esophagus.

DR. H. H. JANEWAY, New York: The first experiments which I made in intrathoracic surgery were performed under conditions of negative air pressure. These experiments were made in a hermetically sealed chamber, large enough to hold the operator and two assistants. The work done within this chamber was confined to resections of lobes of the lung, and sufficient successful work was done to render the experimenters familiar with the conditions or operating under negative air pressure. These experiments, however, were interrupted by peculiar outside circumstances, and since then I have adopted the positive pressure method of Professor Brauer. I have found the negative and positive pressure methods equally satisfactory.

The form of apparatus now used to supply positive pressure is essentially the box designed by Dr. Brauer of Marburg and Dr. F. T. Murphy of Boston. The experiments with this apparatus have been entirely limited to attempts at resection of the oral end of the stomach and the aboral end of the esophagus, and certain points of importance have been developed. The first is the fact that greater asepsis must be maintained in intrathoracic surgery than elsewhere in the body. I believe that raw edges of mucous membrane can not be exposed here with the same impunity with which they are within the abdomen. The second fact developed is that resections within the thorax can not be safely, or perhaps even successfully, performed by the suture method. In a series of operations done by this method there was a mortality of 100 per cent. The anastomosis was completed in each case in such a way as not to expose in any stage an infected edge of mucous membrane, and a double line of circular Lembert sutures were introduced. Nevertheless, I doubt whether in any one of them the anastomosis was or could be made tight enough to resist the cupping effect of the partial vacuum existing within the pleural cavity after the chest wall was closed. Indeed, the condition may be likened to a Bier's hyperemia with many of the advantages turned into actual disadvantages. The insufficiency of the suture method to prevent leakage was confirmed by test anastomoses made with the button-and-suture method outside of a dog's body, on segments of intestines removed, and subsequently subjected to a hydrostatic pressure of 250 mm. of mercury. My experience, therefore, and Dr. Sauerbruch's agree that the successful accomplishment of this anastomosis requires the use of the button. The Murphy button is unsatisfactory from the standpoint of time and from that of aseptic introduction. The new button, on the contrary, is quickly and cleanly introduced, and its use constitutes a decided advance. In construction of the button I have suggested to Dr. Green that an elongation of the spring ring would so protect the perforating knives that no harm could be done with them during the introduction of the button, and also that the cutting edge of the knives be broadened out a little below the point so as to give immediate drainage. The success of intrathoracic-gastroesophageal resections depends on hermetically sealed circle of union. This is not safety attempted by suture or by the Murphy button. We deem it most important to provide against the loss of heat during the operation. The inspired air within the box is warmed, and, in order to diminish the general and local shock accompanying intrathoracic work by an adequate supply of external heat to the body of the subject we have made use of an electric pad, with very definite beneficial effect. In my apparatus the manometer is situated within view of the operator, his assistant and the anesthetist. This manner of regulating the air pressure has been utilized rather than any automatic arrangement; first, because of its simplicity; and second, because it was very rarely found necessary to change the position of the stop-cock, for the purpose of maintaining a constant pressure, after the operation had started. The position of the glass porthole is such that the subject being anesthetized is constantly within full view of the anesthetist. Inside the box is a bracket for the support of the head of the subject. There are also lights along the rear wall. These serve the double purpose of affording illumination and of keeping the atmosphere within the box at the desired temperature. This is a most important point, for in the opening of the pleural cavity, and the exposure of this large surface to the room temperature, much heat is lost, and the respiration of warm air is helpful in keeping the blood at the body temperature. With a temperature of 94 degrees inside the box, the postoperative temperature of some of my dogs has been 101, or about normal for this animal. One hand is sufficient for managing the anesthesia. In an emergency, however, the other hand can be introduced through the second opening.

DR. GEORGE E. FELL, Buffalo: I happen to be probably the first man to demonstrate practically the value of forced artificial respiration in saving human life, and that is now over twenty years ago. I was professor of physiology in a medical school and also a medical practitioner. When I began my work of "forced respiration," the medical world (through Marshal Hall), said that we must not use bellows of any kind. In my physiologic work in opening the chests of dogs I discovered there was much error in this dictum. After I lost my first patient—a man who had taken morphin—after trying the Sylvester method I determined to use my laboratory methods in the next case. A man took 16 grains of morphin. After working two hours and a half by this method I saved his life. On the knowledge of the defects in this apparatus I built the apparatus I now use in my work and exhibit here.

The same principle can be applied to thoracic surgery, and readily applied. With this apparatus I breathed for 18-day-old infant who had been given one grain of morphin accidentally. The little one was held in a tub of warm water when I saw her, and had been under the influence of the poison for two hours. I had no hope of saving the baby's life. I did a tracheotomy, passed a catheter into the trachea and built it up with larger catheters until I could connect it with my apparatus. I succeeded in keeping the child alive for two hours, but it had received so much morphin that it was impossible to save its life.

In all my work I have been trying to simplify the method so that it can be used as an emergency apparatus. A medical student, employed in the postoffice at night, began to take nux vomica to brace him so that he could continue both his work and his studies. One night he took instead several hypodermic injections of 1/40 grain of strychnin; then he began to notice the contractions of strychnin poisoning. In order to stop this he took morphin hypodermically. He was found unconscious in the morning. I began breathing for him with this apparatus, using the hard rubber face mask which prevents the air from passing outside. I breathed with that for a while, but found it unsatisfactory. Then I tried tracheotomy, using my tracheotomy tube, and respired for him from 9 a. m., July 3, until 10 p. m., July 7—four days and three nights of interrupted respiratory work. He lived, and is now practicing medicine on the Panama Canal hospital service. A boy 16 years old broke some ribs while playing ball and took chloroform to overcome the pain. After this he took about 26 or 28 grains of morphin in a tumbler of water. I breathed for him through a tracheotomy tube for about eighty hours and saved his life.

When you force air into the lungs you expand them as in normal respiration. I have a pair of bellows of which three movements suffice for the inspiration and three for the expira

tion in an adult. A valve controls the inspiratory and expiratory action. The apparatus is simple and satisfactory. As the air goes from the bellows it passes through a channel out of the valve, tending to produce a slight vacuum; if attached to the lungs it has a slight tendency to draw out air, which slightly aids expiration. When you press down on the valve the air passes into the lungs. Attached to the valve is a tube connecting with the oxygen apparatus. When you press down on the valve both air and oxygen are forced into the lung. This apparatus illustrates the so-called positive method. In the surgery of the chest both the positive and negative methods will prove of great value. Professor Schäfer's new method is a step in advance, but taking equal cases it will not accomplish what positive forced artificial respiration will, and is not applicable in surgery of the thorax.

DR. JOHN B. MURPHY, Chicago: The term "pneumothorax" is misunderstood. Pneumothorax, *per se*, does absolutely no harm, as I demonstrated and reported in a paper ten years ago. It is the absence of the expiratory exchange that makes the condition of pneumothorax a dangerous one. In 1,700 cases of artificial pneumothorax, by nitrogen injections, where I used from 30 to 180 c.c. of the gas, I did not have a single case of collapse from the pneumothorax. Why? Because it is not the admission of air into the pleura that makes the danger. It is the absence of respiratory change that makes the condition a dangerous one. You can collapse one lung completely, immobilizing the mediastinal septum, without interfering with the patient's comfort and ease.

Dr. Sauerbruch's cabinet is admirable; it meets every indication. It can be used for negative and for positive pressure, but it is not a question of the air that gets in; it is the fixation after the air is admitted. For instance, remove a section of a dog's chest wall; the mediastinum vibrates freely and ruptures in three to five minutes. On the other hand, let the air enter and clap one hand over the opening, and the dog goes on breathing just as if nothing had happened. If the opening be made large and not small, the subject will not be under respiratory difficulties. It is the little opening that admits more air than goes out that produces the plus pressure, presses the diaphragm to one side, as so commonly occurs in rupture of the lung, and causes the patient so much trouble. The doctor can overcome the difficulty in a moment by taking a large trocar and inserting it between the ribs. The trouble is overcome in a minute, as far as the plus pressure and dyspnea are concerned. Where there is hemorrhage from the lungs, so common in everyday practice, a plus pressure can be produced in exactly the same way. By introducing a trocar, covering the end with cotton so as to prevent the introduction of germs, with each inspiration covering the end of the trocar and removing the obstruction when the subject expires, one can produce a plus pressure that will stop the primary hemorrhage. It will not stop secondary hemorrhage, but a plus pressure is obtained at once simply by placing the finger over the trocar.

With these points kept in mind we can look for better results in the treatment of surgical lesions of the lung. My enthusiasm of ten years ago has diminished materially, however, on account of the incurability of so many lesions of the lung by mere extirpation of a portion of it. But we should have these things under our control in a measure at least because of their scientific value and the probability that they will become of greater practical value. The mere removal of a fragment or lobe of the lung was done four hundred years ago. I have opened a dog's chest, drawn out his lung and let it flatten on the surface, merely preventing the air from going in and out through a small opening, which produced a plus pressure and diminished respiratory exchange. It is this diminished respiratory exchange that must be kept in mind, and not the mere presence of air in the pleura.

DR. VICTOR J. BACCUS, Chicago: At the last meeting of the French surgical congress Broca remarked that a pneumothorax, either accidental or intentional, was not always dangerous to the patient. In his operations on the chest entailing the opening of the pleural cavity, he allows the air to enter through a small opening, thus permitting the lung to collapse slowly. He advises the withdrawal of the anesthesia temporarily—a few minutes suffice. The patient learns quickly to breathe with one lung. Then the operation is continued. In Broca's hands pneumothorax has never proved fatal.

DR. M. B. TINKER, Ithaca, N. Y.: We have, most of us, been accustomed to make use of the methods of Hewitt or Sylvester in cases of respiratory failure on the operating table and of foreign body in the air passages in which the patient had not breathed for some time. In case no apparatus is at hand, Professor Schäfer has shown conclusively that the older methods do not give the patient sufficient air. In abdominal and many other operations it is obviously impracticable to turn the patient on his face to practice Professor Schäfer's method. It occurred to me in teaching anesthesia, some time ago, that we could use a combination of the older methods. If we elevate the arms above the head, thus opening the chest wide, we produce forced inspiration, while to produce expiratory effort we bring the elbows together over the chest and compress the chest, thus getting the action of the Hewitt and Sylvester methods combined. A test of this combination method in the physiologic laboratory of Cornell University shows that it gives a fairly satisfactory amount of air to the patient. Before I had tested this method in the laboratory, however, I had used it in two cases of foreign body in the air passages. In one case the patient had stopped breathing for five minutes; in both cases the method was successful.

PROFESSOR EDWARD A. SCHÄFER, Edinburgh: Dr. Tinker failed to state how many minutes he continued this artificial respiration. If you are going to take the trouble to draw the hands up above the head, you are doing a lot of useless work, because you get abundant air into the lungs without such a procedure. In cases of drowning the prone position is most strongly indicated.

DR. F. SAUERBRUCH, Marburg, Germany: No doubt some of you will expect me to answer the question as to whether, for the performance of operations under artificial respiration, we should use the apparatus for positive pressure, as devised by Brauer, Heller, Robinson, Meyer, Kuhn and others, or whether we should employ negative pressure. The difficulties of any kind of artificial respiration consist in the danger to the lung tissue. If, in animals, no damage results from pumping air into the lungs artificially, this must be ascribed to the fact that the animals experimented on are healthy beings. In the human subject needing operation this is different. Here the changes wrought are frequently so great that artificial respiration of any kind is by no means an indifferent factor. To my mind, it can only be a question of whether positive or negative pressure should be employed. The physiologic apprehensions regarding the positive and negative pressure methods have been shown, by the works of Brauer, Seidel, Meyer and Dreyer, to be without foundation. The points in favor of the apparatus for positive pressure are that it is smaller, cheaper and easier of transportation and that communication between operator and anesthetizer is more readily established.

An objection frequently advanced against the chamber for negative pressure is that its use is intolerable to the subject on account of the heat. This objection, however, is unfounded, inasmuch as in the chambers of latest construction the ventilation is so excellent that the air in the chamber does not become overheated any sooner than in the ordinary operating room. Nor is the cost of such a chamber as great as is generally supposed. It is possible to obtain a satisfactory apparatus for from $1,000 to $1,200. Furthermore, any ordinary room can be converted into an operating chamber for operations to be done under differential pressure. All that is necessary for the purpose is to provide for a hole through the door or wall of the room through which the patient's head can be passed, and to supply a suction pump, which by the introduction of the T tube can easily be converted into a pump for positive pressure. Eventually one might construct a light, easily portable chamber of duck or canvas which would answer all practical purposes. A point of great importance, in my opinion, is that in all forms of negative pressure ap-

paratus we are in a position to arrange for a reliable narcosis (also when arranged for positive pressure) so that disturbances due to vomiting, the danger of aspiration as present when other apparatus for positive pressure is used, are not encountered. Recently we discovered another advantage of negative as against positive pressure, namely, that in case of "tension-pneumothorax" and consecutive emphysema of the mediastinum and subcutaneous cellular tissue the mere opening of the thoracic cavity under negative pressure is sufficient instantly to relieve this dangerous condition. With positive pressure this is impossible for physical reasons.

DR. SAMUEL ROBINSON, Boston: One side of the human chest has often been opened without the use of any apparatus and without the onset of alarming symptoms of pneumothorax. Operations fatal to the normal dog have been successful on the human being. There are two reasons for this: The mediastinum of the dog is not a rigid partition separating the two sides of the thorax, but a fluttering membrane which in the presence of a one-sided pneumothorax yields to respiratory variations of the intrathoracic pressure of the unopened side and thus seriously affects the function of the sound lung. The human mediastinum, on the other hand, is a firmer structure with better anchorage. Hence the opening of one chest interferes to a less extent with the excursion of the lung of the unopened side, and one lung can to a certain extent compensate for the loss of the other. Furthermore, operations on the human being are generally in the presence of pathologic conditions in which the dangers are lessened by pleural adhesions and thickened mediastinum. What better proof is there, however, of the dangers associated with opening the human chest without apparatus than the reluctance of operators to perform an exploratory thoracotomy. I believe in the simplicity and portability of the positive pressure apparatus. There is need primarily of an apparatus to render exploratory thoracotomy a safe procedure. Rhythmical inflation is a more complicated procedure and requires skilled administration to obviate its dangers. I believe that the best method is the employment of a constant pressure with ample supply. The tubes conducting this pressure to the respiratory tract should lead either to a face mask or to an intubation apparatus, and my purpose is to perfect this method until simple enough for practical usage. Of the practicability of the method, as such, I am now convinced.

It is to be regretted that the discussion to-day has consisted in the results of animal experiments under positive pressure versus the results of operations on the human being under negative pressure. The latter would at first seem more convincing. Professor Brauer, whose absence at this symposium is much regretted, would have reported the results of the application of positive pressure to the human being as administered with his own apparatus and with modifications of it in European clinics. The operations performed with this simple method, although fewer than those performed in the negative pressure cabinet, are nevertheless equally promising in their results. The cabinet mortality may be higher than that of the positive method, but the serious nature of Professor Sauerbruch's esophageal operations must, of course, be taken into consideration. I urge you, therefore, to bear in mind that the results of operations on the human being under positive pressure have been favorable. We present the results of our animal experimentation to support the method on the basis of physiology and to report improvements in technic.

DR. N. W. GREEN, New York: The point Dr. Schäfer brought out is valuable. Atropin is a great aid in preventing the effect of reflex irritation in work on the chest. It is a cardiac stimulant. You probably well know the physiologic experiment with the frog's heart, which was excised, stopped by muscarine, and which began to beat again when atropin was dropped on it. We ought to bear that in mind in our surgical work to combat shock. In the experiments on dogs I have opened both pleuræ in some cases. In other cases I opened only one pleura. It is well to remember that the mediastinum is very movable in the dog and also in children. Opening one side in a child in case of an empyema or anything like that may be a very serious matter, unless some aid is present, because the mediastinum collapses so easily toward the side that is not opened. If by any chance you have given too much ether—and ether kills by failure of the respiration—you can resuscitate the animal or person by means of rhythmical inflation. If you have not rhythmical inflation, you can produce it by pressure with the hands on the chest. When failure of respiration occurs, quite a time elapses between the time when you have such failure and heart failure, and rhythmical respiration carried on during that time may save the life of your patient.

LARYNGEAL CRISES AND PARESIS OF THE ABDUCTORS OF THE VOCAL CORDS

AS IMPORTANT EARLY SYMPTOMS OF TABES, WITH THE REPORT OF A CASE.

OTTO T. FREER, M.D.

WITH SUPPLEMENTARY REPORT BY STANTON A. FRIEDBERG, M.D.

CHICAGO

Among the symptoms of tabes dorsalis those furnished by the larynx commonly appear early in the disease, may be the first ones to attract attention, and may, indeed, be the first evidences of the affection. Those unacquainted with the possibility that such laryngeal manifestations may indicate tabes fail to understand their significance and usually fall into the error of supposing some local disorder of the larynx, perhaps of slight or no importance, to be the cause of the laryngeal symptoms, whose significance, as evidences of a grave nervous disease, is thus not appreciated. As an example, in the case reported in this paper the opinion was advanced that a small cyst of the lingual surface of the epiglottis, of no consequence whatever, was the cause of persistent recurrence of spasms of the glottis characteristic of tabetic crises. In distinction to the case with which those are led astray who are ignorant of the laryngeal phenomena of tabes, they suggest the disease at once, even when they are present in the slightest degree, to those having a knowledge of them, and they thus lead to a search for the well-known and positive signs of tabes, such as ataxia and rigid pupils, which unequivocally demonstrate its existence.

The usual laryngeal manifestations of tabes are the so-called laryngeal crises, which are recurrent attacks of prolonged spasm of the glottis, and paralysis of the abductor muscle of the vocal cord, the posterior cricoarytenoid. So significant of tabes is the isolated paralysis of this muscle that Sir Felix Semon speaks of it as the tabetic form of laryngeal paralysis *par excellence*. While at first merely indicated by deficient abduction of one or usually, as it is commonly bilateral in tabes, both cords, in time a spastic contracture of the adductor muscles of the cord is superadded to the abductor paralysis, which draws the vocal cord inward toward the midline, so that it finally remains permanently in the median position. This permanent adduction creates no symptoms when the affection is unilateral, but may lead to serious dyspnea when it causes both cords to be in continuous contact in the mid-line. The contracture of the adductors referred to is very slow in developing and years may pass by before it is complete, so that in very chronic cases of tabes the cords may even never meet in permanent contact before the individual dies, and, therefore, in many cases the posticus paralysis, even when bilateral, either creates no symptoms at all or only

after a long period. For this reason it is usually only discovered when a laryngoscopic examination is made.

As a typical illustration of the laryngeal symptoms of tabes I submit the following case report, which is followed by a description and consideration of the manifestations of tabes as they affect the larynx:

History.—The patient was 37 years old and a cabinet maker. He had been married sixteen years and had five healthy children. Twenty-one years ago he had gonorrhea, but denied syphilis. The only other previous illness he remembered was typhoid fever, at the age of 13. His present disease began six months ago with a severe vomiting spell which seemed to be merely seasickness, as it occurred while he was crossing Lake Michigan in rough weather. After he went ashore, however, he continued to have attacks of vomiting at intervals for four months, when they ceased to trouble him. His vomiting occurred whether his stomach was empty or full, the seizure on some days returning three times, on others but once and occasionally several days passing without a vomiting spell. Three months ago while in a room where men were smoking his breath was suddenly shut off by a catch in his throat, which passed off when he went out. Two days later, on the street, he had a much more pronounced attack of spasmodic stoppage of breathing which began with a cough, arrested suddenly by a closure of his throat, so forcible that he could not breathe. He then fell to the ground unconscious and when he recovered, found himself lying in the street. He then arose and walked away. The next attack occurred while he was working. He fell over against his bench, unable to get air, but did not fall down or become unconscious. After these first two suffocative spells others followed at intervals of hours or days, but they never caused him to become unconscious again or to fall down. The attacks began with a cough, followed by a closure of the throat, lasting from one-half to three-quarters of a minute and preventing breathing or utterance of a sound. After this period of complete closure, the air entered his lungs with difficulty, while a loud crowing noise was created in his throat by his breathing. The suffocative seizure also occurred during his sleep, awakening him and preventing his going to sleep again for fear of another attack. A month ago he went to the German Hospital and was treated there with potassium iodid, 72 grains daily. During this time his attacks increased in severity. Of late, since he had been taking potassium bromid in fifteen-grain doses three times a day, the spells of throat spasm had become much less severe and frequent, and no longer happened in his sleep. A characteristic of the attacks was their invariable onset with a coughing spell, which led at once to the suffocative spasm described. The patient had no pain in the limbs, or girdle sensation about his trunk. He had a neuralgic sensation in his left leg, where it was perforated by a bullet and pierced by a bayonet along the inner surface of the tibia in a war some years ago. Four years ago, during a number of months, he had to employ abdominal pressure in order to urinate and at that time he was apt to have urine escape without his knowing it, when he was walking. Two months ago he had a return of this symptom for six weeks.

Laryngeal Examination.—The vocal cords although coming well together on phonation, were only insufficiently abducted during deep inspiration to the extent shown in the illustration. In other respects the interior of the larynx presented no abnormalities. Nose and nasopharynx normal. A small cyst occupied the left vallecula on the lingual surface of the epiglottis.

The following neurologic examination was made by Dr. William Healy:

Neurologic Examination.—In both eyes pupillary reaction to light was much less than it should be and sluggish. No pupil reaction when staring into distance. Incomplete Argyll-Robertson pupil (pupillary reaction to accommodation, but not to light, when staring into distance). Fundi normal. Ocular motions normal. Patient admitted having ptosis for three days a month ago. The Achilles reflexes were both absent. Knee reflexes absent even on reinforcement. Anesthesia to camel's hair brush, beginning above the mamillary line and reaching down nearly to the umbilicus, on the anterior surface of the thorax. Partial, but distinct analgesia below the knees in both limbs. Testes insensitive. Sense of smell normal. Some incoordination when pointing with fingers. When eyes were closed he could not guide the tips of his index fingers together so as to make them touch. Slight incoordination of lower extremities. Romberg's symptom (swaying of body when standing with both feet together and eyes closed) was present in moderate degree. Blood pressure normal. Some dizziness in descending stairs. He finds that he has no trouble in walking about in the dark.

Since writing the above history the patient has entered the laryngologic service of Dr. Stanton A. Friedberg in Cook County Hospital, who gives a further account of his affection in a supplementary report, with a more accurate observation than I could make of an ambulant patient. The report follows this article.

The pupillary changes, the absence of the knee and Achilles reflexes, the area of slight anesthesia found below the mamillary line, the incoordination, the insensitive testes, the partial analgesia below the knees and the history of a spell of bladder insufficiency and ptosis are, even without the other characteristic symptoms of tabes detailed, sufficient to prove its existence

Freer's case of laryngeal crises. View of larynx showing abnormal approximation of cords during respiration; *a*, cyst of epiglottis.

in this patient. The features of laryngologic interest in the case are the spells of interrupted breathing, which the patient describes and which I regard as tabetic laryngeal crises, and the paretic state of the abductors of the cords demonstrable by laryngoscopy.

In my study of the phenomena presented by this patient I have been guided mainly by the classic section on the nervous diseases of the larynx and trachea written by Sir Felix Semon in Heymann's Handbuch. It is unfortunate that this perfect exposition of this difficult theme, a work of 207 pages, does not exist in English, for it makes its intricate subject so clear to the understanding and so vividly interesting that its study becomes a pleasure and not a task. An English edition of Semon's work would tend to arouse the interest in laryngeal neurology in America which it has inspired in Germany and which has led to such important recent researches there in the innervation of the larynx.

I will precede a consideration of the first of the phenomena, the sudden shutting off of the patient's breath, by the following translation of Semon's description of the symptoms of the laryngeal crises of tabes:

The symptoms vary greatly in gravity. In the mildest cases they appear merely in the form of sudden, severe, spasmodic attacks of coughing, possessing no demonstrable organic cause and obstinately resisting all treatment. In cases of medium intensity the cough is preceded by a feeling of tickling, stinging, scratching, burning, or of a foreign body in the laryngeal region. These sensations are followed by a feeling of being throttled, associated with intense anxiety. The breathing becomes labored and then a coughing spell follows, accompanied by long-drawn inspirations, short explosive expirations and evidences of general disturbances of the circulation, such as cyanosis. Retching, attacks of sneezing, salivation, dizziness, sweating and pain in the extremities have been observed and Semon has seen an attack of laryngeal crisis which changed into a gastric one. The paroxysm, most alarming in aspect, ceases after a few seconds or minutes with long, stridulous respirations, which gradually grow less distressing, while the cough dies away. In the severest cases the phenomena described are associated with dizziness, involuntary defecation and urination, loss of consciousness, epileptiform convulsions and cessation of respiration, but even in such extreme instances, as a rule the threatening symptoms disappear spontaneously.

The attacks described by the patient present, typically, the symptoms here quoted from Semon, and may be regarded as belonging to the order of medium severity. In his statement to Dr. Friedberg the patient has described the preliminary abnormal sensations in the larynx or "aura" mentioned by Semon. The characteristic feeling of being throttled, following the aura, is a constant accompaniment of his attacks and also the intense feeling of anxiety mentioned in the description. The typical long-drawn, stridulous respirations succeeding the worst part of the spasm and the final coughing spell are also a part of the seizures. To Dr. Friedberg also the patient spoke of two phenomena often present, dizziness during the attacks and sweating. The second spell even led to the loss of consciousness and falling down characteristic of the severer onsets of the affection. Enough evidences of the disease are therefore present to warrant positively the diagnosis of laryngeal crises of tabes. The only other condition coming into question is ictus laryngis. The symptoms in the seizures of this affection in sequence and quality are identical with the crises of tabes. There is a preliminary cough, then a more or less pronounced spasm of the glottis and falling down and unconsciousness, such as also occurs in the severer type of tabetic crises. The entire lack of any of the signs of tabes, however, serve to distinguish ictus laryngis from a laryngeal crisis.

It has not been my fortune to witness one of the patient's attacks, but Dr. Friedberg's report contains the description of some seen by the attendants at the hospital and of one with laryngoscopic findings seen there by himself. In these seizures the patient complained of severe pain in the laryngeal region lasting for some minutes and also of pain in the region of the heart, indicating irradiation from the medulla into the sensory as well as the motor portion of the vagi nerves. Another evidence of general irritation of the vagi nerves exists in the gastric crises which occurred for so long a period some months ago and which seem to have been supplemented by the laryngeal crises he had later.

Semon says that difficult swallowing, gastric crises and rapid pulse are nervous symptoms often coexisting with the laryngeal crises, but that their most important accompaniment, in a pathologic sense, is paralysis or paresis of the openers of the glottis, the posterior crico-arytenoid muscles or abductors of the cords. Observation has proved this combination of loss or impairment of motion of the abductors, with a tendency to spastic contraction of the adductors in the crises, to be so frequent in tabes that it constitutes a typical phenomenon and is not to be regarded as a mere chance association. The evidence of paresis or paralysis of the abductors in our patient is found in the lack of the outward motions of the cords which should occur during deep inspiration and their permanently close approximation, which narrows the opening of the glottis about one-half (see illustration).

The isolated paralysis of the abductors found in this case is in accord with the rule formulated by Semon, that an organic interference of slow development with the functions of a recurrent laryngeal nerve, always leads first to paralysis of the abductor, (posterior crico-arytenoid) muscle, of the affected cord, paralysis of the adductors, with total loss of motion of the cord, following later if at all. In accordance with this, total paralysis of a vocal cord, which implies, of course, total paralysis of a recurrent laryngeal nerve, is extremely rare in tabes. This discovery of the greater vulnerability of the nerve fibers going to the posterior muscle constitutes the celebrated law of Semon, as it is called. It is especially and strikingly found in the laryngeal paralyses of tabetic origin, so strikingly that Broeckaert, who attempted to disprove the law of Semon so far as it applied to the trunk of the recurrent laryngeal nerve, admits its truth as applied to slow degeneration of its nuclear origin as it is found in tabes. Recent animal experiments and clinical observations extending over twenty-five years, in which exceptions to the law have been searched for by a multitude of observers with the diligence inspired by an ardent controversy, make the conclusion of Kuttner, that the constancy of Semon's law may be regarded as proven, the only one which may be reasonably arrived at. But one exception to the law has been discovered in the long time since it was formulated, and is acknowledged by Semon with characteristic frankness—the celebrated case of Saundby, in which a carcinoma of the esophagus caused degeneration of the portion of the recurrent laryngeal nerves supplying the adductors of the cords while sparing the abductors. As Kuttner says, such an example merely proves the rule.

The greater vulnerability of the nerve fibers going to the abductors has been strikingly shown in the animal experiments of Fränkel and Gad, who isolated and gradually chilled the trunk of the recurrent laryngeal nerve. In all of their investigations, confirmed by Kuttner later, the abductor motions of the cords ceased first and only later did the adductors become paralyzed with fixation of the cord in the cadaver position. As the nerve trunk recovered, on warming, the motions of the adductors were the first to be restored. In explaining the common association of posticus paralysis in tabes with the laryngeal crises Semon says in Heymann's Handbuch:

As shown in the chapter on laryngeal paralysis, the medullary nuclei of the abductors of the glottis are the first to degenerate where laryngeal paralysis occurs at all in tabes. At the same time, however, the ganglion cells of the closers of the glottis are in a state of increased latent irritability and react more quickly and energetically to reflex irritation than normally, so that conditions that would for instance excite a mere cough in a healthy person create spasm of the glottis in tabes on account of this excitable state of the vagi nuclei.

The abnormal sensations in the throat which introduce the crises Semon regards as also dependent on the excessive irritability of the medullary centers and per-

haps also the peripheral course of the sensory nerves of the larynx. Burger, Semon states, also regards irritations of the sensory part of the nerves as present in the crises of tabes. The unusual symptom of the occurrence of pain in the region of the larynx during the crises complained of by this patient is in accord with this view and indicates central irradiation into the superior laryngeal nerves.

The laryngeal paralyses found in tabes, though often the first and possibly the only paralytic symptoms to occur, are but a portion of a group of paralyses found as results of pathologic degenerative changes in the cranial nerves or their medullary origin. Thus paralyses of the ocular muscles, the levator palati, the trapezius or sternomastoid muscles may be found. Indeed, the paralyses due to cranial nerve involvement in tabes may be so numerous and extensive that bulbar paralysis is simulated.

The degenerative changes found in the laryngeal paralyses of tabes may be found in the nucleus of the vago-accessorius nerve, in the ascending root of the glossopharyngeal nerve, or in the intrabulbar root fibers of the vagus and accessorius or in their peripheral extensions. The degeneration may also be limited to the vagus trunk or that of the recurrens, the medullary portions of the nerves being intact.

LATER HISTORY OF THE CASE BY DR. STANTON A. FRIEDBERG.

The patient was brought to Cook County Hospital in a police ambulance on Feb. 10, 1908. He stated that his illness began about eight months before this date when he was seized with attacks of vomiting at irregular intervals, which lasted for a period of five months. For the past two months he had had dyspneic attacks on going from a warm atmosphere into a cold one and *vice versa*. For fourteen days he had suffered from pain on swallowing solids. More recently he had complained of some ill-defined "sticking" pains in his legs. His main complaint was on account of the dyspneic or choking spells which had been more frequent of late. About half an hour before the attack there would be a general feeling of warmth over the entire body. Immediately preceding it there was a tickling sensation in the larynx, which caused him to cough once or twice and then the spasm followed. Vertigo was present during the attack, not before. There was no loss of consciousness. He had repeatedly been aroused from his sleep by the tickling in the throat which preceded his attacks, the latter following on such awakening.

Examination.—Patient stalwart German, well nourished, muscular. Pupils equal, reacted imperfectly to light and very sluggishly to distance. Marked Romberg symptom. No patellar or Achilles reflexes. Areas of analgesia. Examination of the larynx disclosed a small tumor on the anterior surface of epiglottis, left side, which yielded to touch of probe. Vocal cords were slightly congested. On inspiration the right cord moved slowly outward to about half the normal distance. The left moved a little more slowly than the right to about the same distance. On phonation the cords did not approximate completely, leaving a small opening throughout the anterior three-fourths. In the posterior one-fourth the opening was a little larger and was slightly triangular in shape.

Since his entrance into the hospital, his pulse had varied from 84 to 120. The temperature from 98 F. to 99.5 F. At various times he complained of difficulty in breathing other than that produced by the spasmodic attacks. More or less cough was present due to an almost continual irritation in the larynx and trachea. At times he had pain in his throat independent of any efforts at swallowing. What may be considered as characteristic of his condition was his extreme nervousness due to the ever present fear of an attack. He slept very poorly. Cleared his throat often. The greatest number of attacks in any one day have been four, although before coming into the hospital he had had as high as seven. Recently several days elapsed without any. Several attacks were produced by the irritating effects on the throat of the bromid solution he has been taking.

Objective Signs.—The objective signs during a crisis were as follows: Marked inspiratory dyspnea; interrupted stridor; expression of great fear; face suffused; eyes wide open and staring. Referred to throat and precordium as seat of great distress. This latter was not due to pain, as in an anginal attack, but to the inability to obtain sufficient air. The hand would be clasped about the throat as if in an effort to obtain relief from choking. He walked about unsteadily on account of the vertigo which was present. The pulse increased in rapidity and became irregular in quality. After an attack it was usually about 120. His face was pale, respirations were increased, and he was markedly agitated. The attacks lasted from a few seconds to 15 minutes although in the latter instances the greatest intensity was usually for about 5 minutes.

Laryngeal Appearance.—In attempting to cocainize the larynx a crisis was produced. As the laryngeal mirror was in position at this time an excellent opportunity was given to view the larynx. The cords were fixed firmly in the position of phonation. In spite of the violent inspiratory efforts there was not the least abduction. This position was held for at least 15 seconds. The small elliptical opening between the cords as described above was present and undoubtedly it was due to this factor that the stridor was interrupted. The edges of the cords were seen to vibrate slightly, which demonstrated that a little air at least must be passing through the glottis. Perhaps to this fact may be due the absence of the loss of consciousness which one would expect in a complete closure of the glottis and which occurred in his first attack. This evident involvement of the internal thyreo-arytenoid seems to be due to the strain placed on these muscles by the severe inspiratory efforts, which has caused them to yield a little. In other words it may simply be an effort to counteract the effects of the posticus paralysis. With the recurrence of abduction of the cords the attack subsided, to immediately recur, as would happen at times, or to be held in abeyance for a variable length of time.

At the present writing he has had no attack for the past eight weeks.

FORMALDEHYD DERIVATIVES.

THEIR FATE AND ACTIONS IN THE BODY TOGETHER WITH OBSERVATIONS ON SOME OTHER URINARY, INTESTINAL AND WOUND ANTISEPTICS.

*Report to the Council on Pharmacy and Chemistry.**

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CLEVELAND, OHIO.

I. INTRODUCTION.

The consideration of certain proprietary "internal antiseptics" by the Council on Pharmacy and Chemistry revealed important discrepancies between the claims of the manufacturers and the results obtained by other investigators with analogous products. It appeared to me that a fair disposition of the questions thus raised could only be obtained by a direct experimental investigation, which I, therefore, undertook. I also believed it worth while to compare the antiseptic value of these products with those of the older and better known drugs. In the determination of the antiseptic value I have departed from the ideal, but highly artificial, conditions of the customary culture experiments, and have aimed to re-

* From the Pharmacological Laboratory of Western Reserve University.

*Because of lack of space, the article as here published is a condensation of the original report, reprints of which may be obtained by application to the author.

produce, so far as possible, the conditions under which the drugs are actually used. Exception may, of course, be taken to the application of any laboratory experiments to clinical problems; but until a clinical method of comparing antiseptic values is invented, it seems to me unwise to discard the positive and definite data obtainable under these artificial conditions.

II. THE LIBERATION OF THE ANTISEPTIC RADICLES IN PURE SOLUTION.

The claimed antiseptic qualities of most of these drugs are based on the assumption that they are decomposed in the body, with the regeneration of the formaldehyd, salicylate, or other active radicles. Before investigating the more complex problem, whether or not these decompositions occur in the body, I investigated the decompositions in simple solutions under the influence of reagents which are somewhat, but not much, more powerful than the conditions obtaining in the body. I am indebted to Dr. W. W. Williams for aid in these tests.

A. THE LIBERATION OF FORMALDEHYD IN PURE SOLUTIONS.

Method.—A knife point (about 0.05 gm.) of the substance was placed in test tubes with about 10 c.c. of water, 1 per cent. hydrochloric acid, or 1 per cent. sodium hydrate. The first set of tubes was boiled;[1] if a positive result was obtained, a second set of tubes was prepared and tested immediately after mixing. If the result was negative, a third set of tubes was allowed to stand at room temperature for an hour. In a few instances, tests were also made after the tubes had been kept at from 37° to 40° C. for varying periods.

Before testing, the solutions were filtered if they contained any undissolved material. Some of the solutions were too much colored to be suitable for the direct application of the Jorissen test. In these cases, 1 gm. of the substance was placed in a flask with 100 c.c. of the reagent and distilled, the first 50 c.c. (approximately) of the distillate being collected and tested.

The Jorissen test for formaldehyd was used throughout, applied as follows: About 10 c.c. of the solution were rendered distinctly alkaline with sodium hydroxid and if no marked change occurred, there was added a very little dry phloroglucin, or 2 c.c. of a 1 in 1,000 solution. A control test was always made with water, so that even a very slight positive reaction could be identified. The results are given in Table 2, where the apparent solubility is also noted.

Summary.—These results may be summarized as follows, in the order of readiness with which formaldehyd is liberated.

(1) Glutol contains considerable free formaldehyd (CH_2O) and an additional quantity is liberated by boiling, in all media; most strongly in the alkaline, less in the acid and least in the neutral medium.

(2) Citarin and novaspirin develop formaldehyd promptly, in all media, even in the cold. The reaction is greatest in the alkaline, less in the neutral and least in the acid medium. The citarin liberates the formaldehyd somewhat more readily.

(3) Hexamethylenamin and tannopin (see below) develop formaldehyd in all media, most in acid, less in neutral and least in alkaline. The reaction occurs slowly at room temperature, more rapidly at 37° C. and promptly on boiling.

(4) With iodomuth, tannoform and tannopin the lower temperatures could not be tried completely by our method on account of discoloration; on distillation, they all liberate formaldehyd as follows:

Iodomuth: Most with alkali, doubtful trace with acid, none with water.

Tannoform: Most with alkali, some with acid and water.

Tannopin: Most with acid, less with water, least with alkali.

However, Tannoform filtered cold gave the reaction at once in acid and especially in neutral solution, indicating that it contains some free formaldehyd.

Tannopin gave no reaction at once with water so that it contains no free formaldehyd; this is liberated in the cold, at once by hydrochloric acid, more slowly by water.

(5) Formidin, Guaialin, Sodi-forma-sal and Ur-a-sol: These do not liberate formaldehyd in any reaction, even on boiling or distillation.

B. THE SALICYLIC ACID TEST.

The manufacturers of several of these products cite a positive salicylic acid test in the urine or intestine as evidence of the decomposition of the molecule. Before this can be accepted as a proof, it must be investigated whether the compounds themselves do not give the ferric chlorid reaction. This was done in the experiments shown in Table 3. The disposition of the experiments was similar to that of the preceding section; the alkaline filtrates were neutralized and again filtered.

It is evident that all the products which are soluble give the test directly; the intensity of the reaction being practically proportional to the solubility. The positive outcome of the salicylate reaction can not, therefore, serve as evidence of decomposition since it is certainly given by the undecomposed products.

C. THE LIBERATION OF IODID.

Formidin and iodomuth contain iodin in the molecule, and the application of the iodid test might possibly serve as a means of recognizing decomposition. The experiments in Table 4 were made and show that formidin contains some free iodin; iodomuth does not contain this impurity. Dilute acid alone does not liberate iodin from either product; but the ordinary iodid test (dilute acid and nitrite) is positive with both, so that it can not be utilized to demonstrate a decomposition of these products.

III. THE LIBERATION OF THE ANTISEPTIC RADICLES BY PANCREATIC DIGESTION.

In the medicinal use of these drugs, any decomposition of compounds of this class would occur principally in the intestine, through the agency of the pancreatic juice, as has been shown by the researches of Neucki[3] and Lesnik[4]. This would indeed be the only possibility for the insoluble drugs; with those which are soluble, the possibility of decomposition elsewhere in the body must be reckoned with; but the decomposition by pancreatic ferment is certainly of prime importance. The method of digestion outside of the body was deemed by me preferable to the alternative method of introducing the drug into a ligatured loop of the duodenum of living animals. The decomposition would be the same in both methods; but the absence of decomposition products in living animals might be attributed to their absorption.

1. In "boiling" the solution, the temperature is merely brought to the boiling point and the tube plunged at once into cool water. The same method was used with the urines.

3. Arch. f. exp. Path. u. Pharm., 1886, xx, 367.
4. Arch. f. exp. Path. u. Pharm., 1887, xxiv, 167.

Several series of these digestive experiments were made, following closely the general methods of the authors just cited. The antiseptic effects were observed incidentally, but these will be described in a later section.

RESULTS.

The results are presented in Table 5. The corresponding results with pure watery solutions are added for comparison. These results indicate that pancreatic digestion does not decompose these drugs more readily than does water; the only exception to this rule are the saponification of salol, and, to a slight extent, of urasol. The fact that glutol is not decomposed is particularly striking; the pancreatic digest contained even less free formaldehyd than the watery solution. This was doubtless due to the evaporation of the free formaldehyd which is present in the original product.

be transferred unhesitatingly to residual ammoniacal fermentation in the bladder. As to other cystic infections, the possibility of a specific susceptibility of pathogenic bacteria to selected antiseptics needs scarcely to be considered; first, because the claimed antiseptic radicles (formaldehyd and salicyl) are alike for all of these drugs; and second, because the observed differences in the antiseptic effects are so large that they would overshadow any individual actions.

The principal results are as follows: Hexamethylenamin rendered the urine strongly antiseptic; novaspirin, salol and sodium salicylate rendered it feebly antiseptic. None of the other drugs had any discernible effect on the keeping qualities of the urine.

The urine did not contain any free formaldehyd with any of the drugs. Formaldehyd was formed in the hexamethylenamin urine, but in none of the others. The

TABLE 5.—Tests on the Pancreatic Digests.

	Tests on the Filtrate.				Tests on the Distillate.			Reaction of Distillate.	
	Series 1.	Series 2.	Series 3.	Pure Watery Solution.	Series 2.	Series 3.	Pure Watery Solution.	Series 2.	Series 3.
A. Jorissen's Reaction for Formaldehyd.									
Control	Negative.	Negative.	Negative.	Negative.	Negative.	Negative.	Negative.	Neutral.	Strongly acid.
Hexamethylenamine	. . . . .	. . . . .	Trace.	Trace.	. . . . .	Fair	(Fair)	. . . .	Neutral.
Tannopin	. . . . .	Positive.	. . . . .	Trace.	Positive	Good.	Positive.	Acid	Strongly acid.
Formidin	Negative.	. . . . .	Negative.	Negative.	. . . . .	Very doubtful tr.	Negative.	. . . .	Slightly acid.
Ur-a-sol	Positive?	Negative.	Negative	Negative.	Doubtful trace	Negative.	Negative.	Neutral.	Slightly acid.
Sodi-forma-sal	Negative.	Negative.	Negative.	Negative.	Trace??	Good.	(Negative).	Neutral.	Fairly acid.
Iodomuth	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	Negative.	Negative.	. . . .	Strongly acid.
Guaialin	Negative.	Negative.	Negative.	Negative.	Negative.	Negative.	(Negative).	Neutral.	Strongly acid.
Citarin	. . . . .	. . . . .	Fair.	Good.	. . . . .	Good.	Good	. . . .	Strongly alkaline.
Novaspirin	. . . . .	. . . . .	Good.	Good.	. . . . .	Good.	Good	. . . .	Acid.
Glutol	. . . . .	. . . . .	Negative.	Good.	. . . . .	Trace.	(Good)	. . . .	Strongly acid.
Tannoform	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	Fair	Positive	. . . .	Strongly acid.
B. Ferric Chlorid Reaction for Salicylates.									
Control	Negative.	Negative.	. . . . .	Negative					
Formidin	Positive.	. . . . .	Fair	Positive.	. . . . .	None.	None.		
Ur-a-sol	Positive.	Positive.	. . . . .	Positive.	. . . . .	Fair (winter-green odor).			
Sodi-forma-sal	Positive.	Positive.	. . . . .	Positive.	. . . . .	Trace?			
Guaialin	Negative.	. . . . .	. . . . .	Negative.	. . . . .	. . . . .			
Novaspirin	. . . . .	. . . . .	. . . . .	Doubtful.	. . . . .	Positive	(Positive on boiling).		
Salol	. . . . .	Trace.	Strong	Negative.					
C. Iodid Reaction.									
Formidin	. . . . .	. . . . .	Positive.	Positive.	. . . . .	Negative.	Trace.		
Iodomuth	. . . . .	. . . . .	Positive.	Positive.	. . . . .	Negative.	Negative.		

EXPERIMENTS ON OTHER TISSUES.

Intestine and liver were tried by the method of Series 1, with the same results as those found for the pancreas.

IV. EVIDENCE OF DECOMPOSITION FURNISHED BY THE URINE; EFFICIENCY AS URINARY ANTISEPTICS.

The absorption, and in some cases, the decomposition of these substances in the body might be demonstrated by the examination of the urine. Accordingly a considerable number of experiments were made, all on one person. The drugs used were: hexamethylenamin; tannopin; formidin; ur-a-sol; sodi-forma-sal; iodomuth; citarin; novaspirin; tannoform, and as controls: Salol; sodium salicylate, sodium benzoate, sodium phenolsulphonate, and boric acid; all in doses of 0.5 and 1.0 gm.

In addition to the chemical examination of the urines, their keeping qualities were determined by exposing them in the incubator. This approaches the conditions of cystic fermentation so closely that the conclusions may

formic acid excretion was not increased by any of the drugs (save possibly a trace with hexamethylenamin).

The urine furnished evidence that ur-a-sol, sodi-formasal, and novaspirin were absorbed, either as such or with decomposition; that iodomuth was absorbed to a slight extent only (with decomposition); that formidin was not absorbed; there was no definite evidence as to tannopin and tannoform.

The urine did not furnish any definite evidence of the decomposition of tannopin, formidin, ur-a-sol, sodiforma-sal, citarin, novaspirin or tannoform; iodomuth was decomposed to a slight extent only.

The taste of ur-a-sol and sodi-forma-sal is markedly objectionable.

METHODS, EXPLANATIONS AND PROTOCOLS.

Doses.—It will be noted that the doses are generally the largest single doses which are advised therapeutically.

Collection of Samples.—The urine was collected continuously from two to three hours before taking the drug to five or six hours after taking, and again on the following day. An aliquot part of each sample was used for the qualitative and incubator

tests, and the remainder was used for the formic acid determinations. All tests were controlled on the sample of urine collected before taking the drug.

Formaldehyd.—The Jorissen test was used throughout. It was applied directly to the urine; after momentary boiling, and after standing in the incubator. The negative results of the direct test will not appear strange to any one acquainted with the chemical properties of formaldehyd; Blum, Pohl, Ebert and Giannelli[5] have already shown that even large quantities of formaldehyd, administered as such, do not reappear in the urine.

Salicylate.—The urine was acidulated with hydrochloric acid and dilute ferric chlorid added. When the test was negative the urine was boiled with the dilute acid and also with concentrated acid, and tested after partial neutralization. The direct test by the first method gave the best results.

Iodid.—The urine was acidulated with 25 per cent. sulphuric acid, a few drops of 1 per cent. sodium nitrite were added, and the solution shaken with chloroform.

Bacterial Turbidity.—At the end of the day, from 50 to 100 c.c. portions of each sample were placed in small flasks, loosely stoppered, and set in the incubator, which varied between 37 and 42° C. The control samples were always turbid on the following morning.

FORMIC ACID DETERMINATIONS.

Pohl[6] has shown that formaldehyd and methylene derivatives are (at least partly) oxidized into formic acid in the body; and formic acid is excreted (in part) unchanged in the urine, provided the quantity exceeds a certain minimum. This minimum is about 1 gm. for a 7 kilo dog—its amount has not yet been determined for man. Smaller quantities are oxidized completely. The larger part of the formaldehyd also underwent complete oxidation. Since corresponding experiments on man have not been recorded, it was not altogether impossible that some of the methylene of these compounds might be excreted as formic acid, so that the determination of this substance might serve as an index of their decomposition. I am indebted to Dr. J. D. Pilcher for these determinations.

The method described by Pohl[7] was used, always neutralizing with lime water. We can confirm his observations that this expedient gives reliable results in the presence of formaldehyd. The determinations were made in duplicate, using from 100 to 300 c.c. of urine for each test, and averaging the results.

Since a somewhat variable quantity of formic acid is excreted normally, it was necessary to make control estimations. Instances of these are given. In over thirty determinations, the normal quantity of sodium formate in the urines of the first period of the day (i. e., between 6:30 and 10 a. m.) varied from 0.28 to 3.37 mg. per 100 c.c. mean 1.25 mg.; and from 0.6 to 4.58 mg. per hour, mean equals 2.25 mg. In the second period of the day (i. e., between 9 a. m. and 4 p. m.) it varied between 0.12 and 3.86 mg. per 100 c.c., mean equals 1.5 mg.; and from 0.19 to 6.31 mg. per hour, mean equals 1.99 mg. In calculating the "normal excretion," 2 mg. an hour was taken as a basis. The theoretically possible quantity was calculated on the assumption that all the methylene (CH_2) groups of the drug were excreted as sodium formate ($NaCO_2H$). It will be seen that the excretion of formic acid after these drugs remained within the normal limits, and certainly did not correspond to the quantity which could be formed from the drugs. Since such drugs as citarin are certainly absorbed and decomposed in the body, the results prove that the oxidation of medicinal quantities of the methylene radicle is complete in the human organism, and does not give rise to the excretion of either formaldehyd or formic acid.

An abstract of the protocols for the individual drugs is herewith submitted, followed in each case by the conclusions which seem to me justified:*

5. Heffter: Ergebnisse d. Physiol., 1905, iv, 219.
6. Arch. f. exp. Path. und Pharm., 1893, xxxi, 281.
7. Loc. cit., pp. 285 and 292.

*Only the conclusions are printed in this abstract. The protocols are contained in the reprints.

CONCLUSIONS.

A considerable part (if not all) of the hexamethylenamin is excreted unchanged, the excretion starting within eleven minutes and being completed, with single doses, in 5 hours.

A part of the hexamethylenamin of the urine is converted into formaldehyd outside of the body. This takes place to a slight extent only, at room temperature; much more extensively at body temperature; but even then the conversion is so slow that it is not completed in three weeks, when fairly large doses have been taken. The formic-acid excretion shows a very slight, somewhat doubtful increase; at most an insignificant portion of the drug is excreted in this form. The urine, containing hexamethylenamin, resists bacterial fermentation indefinitely; it is not quite so resistant to the growth of molds and algæ.

The urine, after taking tannopin, does not contain it, nor any of its decomposition products. The urine is not antiseptic.

Neither formidin nor any of its decomposition products are found in the urine. Considering the delicacy of the iodid and salicylate reactions, it is apparent that no appreciable amount can have been decomposed, or absorbed from the intestine.

Some of the ur-a-sol is absorbed and excreted, either as such or after decomposition; it could not be decided which. The quantity excreted is not sufficient to act antiseptically on the urine. The taste is seriously objectionable.

Sodi-forma-sal behaves like ur-a-sol.

An insignificant trace of iodid is split off and absorbed. There is no evidence of further decomposition. There is no antiseptic action on the urine.

Neither citarin, formaldehyd nor formic acid is excreted in the urine; this has no antiseptic qualities. The urine was alkaline in the first experiment, but not in the other two experiments.

The appearance of salicylate in the urine proves that some novaspirin has been absorbed either as such or with decomposition. Since novaspirin itself liberates formaldehyd readily, while no formaldehyd can be liberated from the urine, it appears that the methylene group has been split off and altered. Since there is no additional formic acid in the urine, this substance can not be the end product of the reaction.

One of the urines was fairly antiseptic, the other not.

The urine after tannoform does not contain formaldehyd or formic acid; nor is it antiseptic.

THE "OLDER URINARY ANTISEPTICS."

The following substances were used to control the preceding observations.

Salol is absorbed and excreted, after cleavage. The urine is but slightly antiseptic.

Sodium salicylate renders the urine slightly antiseptic.

Sodium benzoate did not render the urine antiseptic.

Sodium phenolsulphonate did not render the urine antiseptic.

Boric acid did not render the urine antiseptic.

V. *ANTISEPTIC ACTION AS TESTED ON PUTREFYING PANCREAS AND BLOOD.*

EFFICIENCY AS INTESTINAL AND WOUND ANTISEPTICS.

As has been previously explained, I aimed to use methods which would approximate the conditions of the body more closely than the ordinary culture tests. I have been rather surprised at the reliability of these rough methods.

The results of the urine tests have already been detailed. For estimating the usefulness of intestinal antiseptics, I utilized the retardation of pancreatic putrefaction. The pronounced odor renders this method peculiarly satisfactory. The saponifying action of the pancreas reproduces the intestinal liberation of the guarded antiseptic radicles, which (as in salol) forms the basis of most of the synthetic intestinal antiseptics.

The transference of these results to clinical conditions requires some judgment. A soluble and irritant substance of high antiseptic power might be clinically in-

ferior to a weaker but insoluble and non-irritant antiseptic. Side actions, such as those of bismuth, tannin or salicyl might be clinically desirable or otherwise. These irritant or specific side actions are so well known that I need scarcely point them out. A more serious matter is that my observations are confined to putrefactive organisms, but this criticism is again obviated by the fact that the antiseptic radicles are identical in nearly all of these products, so that specific susceptibility need not be seriously considered.

For judging the usefulness of these drugs as tissue or wound antiseptics, I observed the effect on the putrefaction of the blood. The odor in this method is less pronounced, but sufficiently distinctive. I have more hesitation in transferring the results obtained with blood, directly to the clinical conditions of wound infection, not only because the bacterial organisms are so markedly different, but also because any direct effects on the inflammatory process are clinically so vastly important. The conclusions in this case are, therefore, mainly suggestive.

RETARDATION OF PANCREATIC PUTREFACTION (USEFULNESS AS INTESTINAL ANTISEPTICS.

The method is that previously described. The results are shown in Table 6. The efficiency of sodium benzoate and sodium salicylate, of creosote, and of bismuth subnitrate, are especially remarkable. The relative inefficiency of citarin, glutol, guaiacol carbonate, and even of salol, are equally surprising. The partial efficiency of those methylene products, which the chemical tests showed to be undecomposed, is evidently due to the action of the original substances, and not to the liberation of formaldehyd.

TABLE 6.—RETARDATION OF PANCREATIC PUTREFACTION.

	Odor.
A.—Putrefaction prevented.	
Sodium salicylate	More after 4 days in incubator and 3 days at room temperature.
Sodium benzoate	
Creosote	
Bismuth subnitrate	
Novaspirin	None after 4 days in incubator (urasol has a slight wintergreen odor).
Ura-sol	
Hexamethylenamin	
B.—Putrefaction retarded (in descending order).	
Tannoform	Very slightly putrid in 3 days.
Sodi-forma-sal	Very slightly putrid in 2 days.
Iodomuth	Very slightly putrid in 1 day (does not increase).
Formidin	Slightly putrid in 1 day, more marked in 4 days.
Salol	Slightly putrid in 1 day, more marked in 3 days.
Guaiacol carbonate	Slightly putrid in 1 day, more marked in 2 days.
Tannopin	Slightly putrid in 1 day, very putrid in 2 days.
Glutol	
Guaialin	Markedly putrid in 1 day, very putrid in 2 days.
C.—Putrefaction not retarded.	
Citarin	Equally putrid in 1 day.
Water	

PUTREFACTION OF BLOOD (USEFULNESS AS WOUND ANTISEPTICS.)

Duplicate samples, each of 15 c.c. of fresh defibrinated beef blood and 0.2 gm. of the drugs, were kept in stoppered test tubes at about 40 C. from the morning of February 10 to the evening of February 17, being observed at the end of 2, 4, and 7 days. The tubes to which no drug was added were slightly putrid and of a garnet color at the end of 2 days. The odor was more marked in 4 days and remained about the same at 7 days.

The antiseptic effect is shown in Table 7. The succeeding tables show the associated effects on the color of the blood. The relative inefficiency of glutol is again remarkable. On the other hand, the efficiency of iodoform, boric acid, and bismuth are worthy of notice.

As regards bismuth subnitrate, I have frequently encountered the statement that it should not be used on delicate surfaces, because the sharply pointed crystals, of which it consists, must render it irritant. This seems to be purely theoretical, and would, of course, hold only if the crystals possessed some degree of hardness. As a matter of fact, it is easy to convince oneself to the contrary by dusting a little of the powder into the conjunctival sac. Delicate as this is to any mechanical irritation, the subnitrate causes absolutely no pain.

TABLE 7.—PUTREFACTION OF BLOOD.

	Odor.
A—Prevented completely.	
Boric acid	None in 7 days.
Iodoform	
Quinine sulphate	
Betanaphinol	
Xeroform	
B.—Almost completely prevented.	
Bismuth subnitrate	None in 4 days, very faint in 7 days.
Acetanilid	
Orphol	
Formidin	No odor in 2 days, slightly putrid in 4 days, not more in 7 days.
Ura-sol	
Iodomuth	
Chloretone	
C. Putrefaction delayed.	(That is, the odor developed more slowly but in the end was pronounced, although not as strong as in the next class.)
Glutol	None in 2 days, slightly putrid in 4 days; markedly putrid in 7 days.
Guaiacol carbonate	None in 2 days, marked in 4 days.
Tannoform	
Tannopin	
Tannin	Slight in 2 days, marked in 7 days.
Salol	Slight in 2 days, marked in 4 days.
D.—No antiseptic action.	(The odor in 2 days is as pronounced as in the control tubes).
Calcii carbonas.	
Carbo Ligni.	
Cerii oxalis.	
Zinci oxidum.	

VI.—DISCUSSION OF THE INDIVIDUAL PRODUCTS.

It will be interesting to compare the results of these experiments with those of other investigators, and from the standpoint of the Council, especially with the claims and statements of the manufacturers of the several products.

HEXAMETHYLENAMIN.

This substance was introduced into medicine mainly through A Nicolaier,[8] after careful chemical, physiologic and clinical studies. His results are in complete agreement with mine; except that I am not completely satisfied but that the substance as such may have some antiseptic action. The main results are that the substance is absorbed and excreted promptly and mainly unchanged; that it liberates formaldehyd readily but slowly and persistently under the conditions of the body and urine; that it is the urinary antiseptic par excellence, vastly surpassing all the other substances tried; that it is not quite so effective as other preparations against molds; that it also prevents pancreatic putrefaction, although its prompt absorption would probably preclude its use as an intestinal antiseptic. My experiments did not bear on the reported diuretic and urate-solvent properties.

TANNOPIN.

This is recommended as an intestinal astringent and antiseptic, passing unchanged through the stomach, but slowly developing in the intestine the actions of tannin and formaldehyd. It is also claimed on the authority

8. Deutsche Archiv. Clin. Med., 1899, xxxviii.

of E. Schreiber[9] that some of the hexamethylenamin passes unchanged into the urine.

My results indicate that it is probably acted on to some extent in the stomach. No trace of it could be discovered in the urine, which was not rendered antiseptic. The pancreas and the blood experiments would assign to it a very low value as intestinal antiseptic; they give no information as to its astringent action.

FORMIDIN.

I have not seen the advertising literature for this product, so that I shall merely quote my conclusions:

The substance contains methylene, salicyl, and iodid groups. These are not liberated by water, dilute acid or alkalies, or distillation. (This agrees with the observations of Zernik and Puckner). It contains a small quantity of free iodin as impurity; it was not decomposed by pancreatic digestion. This negative result of the salicylate and iodid tests in the urine proves definitely that formidin was not absorbed and therefore, that it was not decomposed in the human intestine. It had only a slight retarding action on pancreatic putrefaction, and a somewhat stronger action on the putrefaction of blood.

Formidin is an inferior wound and intestinal antiseptic; it is not a urinary antiseptic.

It may be fair to add that the manufacturers, in a letter to the secretary of the Council, submit evidence that relatively enormous doses of formidin, when confined in a ligatured intestine, may sometimes be decomposed to a slight extent. The description of the experiments was not very detailed, nor could they materially affect the above conclusions.

FORMA-SAL COMPOUNDS.

The Organic Chemical Company markets under this group-name various salts of methylene disalicylic acid. In regard to them, the circulars of the company remark:

"The demerits of salicylic acid which cause its disuse—the positive irritation to all mucous membranes; that awful sense of rawness and burning in the stomach, along with a disgusting nausea . . . are absent in the Forma-sal Compounds." I have found both ur-a-sol and sodi-forma-sal pronouncedly and persistently nauseating.

The advertisements claim that formaldehyd is gradually split off, and acts as a urinary antiseptic and uric acid solvent. I have found no evidence that formaldehyd is split off, and the compounds have no discoverable antiseptic action on the urine. This agrees with Frankel's statement.[10]

It is claimed that these compounds are superior to other salicylates in rheumatism. Since they are to some extent absorbed, it is quite possible that they produce some of the actions of salicylates; but I can discover no grounds for the claimed superiority. The claim that "they are the most valuable salicylic acid compounds known" must be stamped as a gross exaggeration, to say the least.

Ur-a-sol might serve as a fair intestinal and wound antiseptic, but would be inferior to other and much cheaper drugs, such as bismuth subnitrate.

In a letter to the Council, the manufacturers state that the urine, after taking ur-a-sol, gives the iron reaction for salicylates. This assertion is correct. But the conclusions which they draw from it, namely, that formaldehyd has been liberated, are absurd since the undecomposed methylene disalicylic acid gives the same reaction. Since the manufacturers mention iron as an incompatibility of the drug, they must have been perfectly familiar with this fact. A letter addressed by the secretary to the chemist to whom the statement was attributed, sent several months ago, has remained unanswered.

IODOMUTH.

This substance is advised as a wound powder and intestinal antiseptic. The advertisement reads in part as follow:

"Appreciating the sedative and healing properties of bismuth, in union with the desiccating properties of gallic acid, we added to them the antiseptic properties of formaldehyd and the alterative and stimulating properties of iodin and created *the* healing agent."

This implies that the various constituents are liberated on the local application of the powder, and this is further and more specificially stated in other advertisements.

The experiments show that these constituents are not liberated to any marked extent under the conditions of the body; and while the drug may serve as an intestinal antiseptic and as a wound powder, it is in both respects inferior to the cheaper bismuth subnitrate.

GUAIALIN.

This is advised as an internal, intestinal and urinary antiseptic in tuberculosis, typhoid, etc. It is stated that its absorption into the blood inhibits the multiplication of pathogenic bacteria. Its decomposition into benzoic acid, formaldehyd and guaiacol is implied, rather than directly stated.

My experiments fail to show any evidence of such decomposition. As an intestinal antiseptic it would be nearly useless; and as it is probably not absorbed, the possibility of its being an internal or urinary antiseptic is too remote for serious consideration.

CITARIN, NOVASPIRIN AND SIMILAR PRODUCTS.

Anhydromethylene citric acid is marketed in the form of its sodium salt (citarin); urotropin salt (helmitol or urotropin-new), and salicylic ester (novaspirin). These are rapidly decomposed, when in aqueous solution, with the formation of formaldehyd. This change must necessarily occur also in the body.

In the case of citarin, the manufacturers claim that the formaldehyd thus liberated dissolves uric acid in the body, even to the extent of dissolving the uratic tophi of gout! Citarin is, therefore, advertised as an "Anti-Lithemic" in gout, chronic rheumatism, etc. No claims are made for it as an antiseptic. With urotropin-new, however, the methylene was credited with the transmissions of formaldehyd to the urine. Nicolaier,[11] however, successfully challenged this claim and showed that the antiseptic effect on the urine was due solely to the urotropin part of the compound. As a result, I understand that this compound has now been withdrawn from the market.

In the case of novaspirin, no action is attributed to the anhydromethylene-citric acid, beyond that of delaying the absorption of the salicyl radicle. It is classed by the manufacturers purely as a salicyl product.

My experiments do not bear on the urate solvent

9. Deutsch. med. Wchnschr., 1897, No. 49.

10. Arzneimittel Synthese, 2nd edition, p. 293. "Während Methylensalicylsäure im Organismus keine Formaldehyd abspaltet, sondern unverändert im Harn erscheint. . . ."

11. Deutsch Arch. f. klin. Med., 1906, v. 89, p. 170.

properties of citarin, nor on the proclaimed superiority of novaspirin over other salicylic esters. The taste of novaspirin is certainly an improvement on that of the forma-sal products. Its excretion is certainly slower than that of sodi-forma-sal, but does not differ materially from that of ur-a-sol or salol. Both citarin and novaspirin tend to render the urine alkaline, after the manner of citrates, which may in part account for an antirheumatic action.

Although formaldehyd is so readily liberated from the products, it does not seem to exert any antiseptic action, presumably because it is instantly bound by the alkali. Citarin had the weakest antiseptic action on the putrefying pancreas, of all the products studied. It was entirely inactive, so far as the urine is concerned. This failure of antiseptic action makes me feel somewhat skeptical as to the claimed urate-solvent action. The novaspirin was markedly antiseptic to the pancreas, and slightly so to the urine; but this action is evidently referable entirely to the salicyl component.

GLUTOL.

This is advised as a wound antiseptic, with the claim that it is itself inactive, but is decomposed by living cells with the continuous liberation of minimal quantities of formaldehyd. Its mechanism of action would therefore be similar to that of hexamethylenamin, but its insolubility would assign to it a very different field of usefulness. My experiments show the following:

Glutol contains some free formaldehyd and a further quantity is liberated in all media. The amount of this free formaldehyd is probably not sufficient to be a serious objection to its use. Pancreatic digestion does not split off a materially greater amount. Since this process is analogous to the digestion by living cells, the specific liberation of formaldehyd by the latter seems somewhat doubtful. The quantity liberated by pancreatic digestion is not sufficient to markedly check putrefaction, the glutol being inferior as a preservative to nearly all the other substances which were tried. Its efficiency on the blood was also poor.

While glutol may be more or less useful in the conditions in which it is advised, the claimed superiority over antiseptics is not borne out by my experiments. It would be distinctly inferior to iodoform, boric acid, or bismuth subnitrate.

TANNOFORM.

This is advised externally as a siccative, antiseptic and deodorant, and also as an intestinal antiseptic—presumably on the assumption that it liberates its two components.

My results indicate that it would be decomposed to some extent in the stomach, better in the intestine; that the urine is not rendered antiseptic; that it is a fairly efficient intestinal and wound antiseptic, superior to tannopin in both respects. I can say nothing as to its astringent action.

ORPHOL AND XEROFORM.

Orphol (betanaphthol-bismuth) is advertised as an intestinal antiseptic and astringent; xeroform (tribromphenol-bismuth) as an iodoform substitute, and also as an intestinal antiseptic. My experience with both is confined to the observation on the preservation of blood. In this respect, xeroform proved the equal of boric acid, iodoform and betanaphthol; orphol was but little inferior, equalling bismuth subnitrate and acetanilid. While both products would doubtless accomplish the purposes for which they are advised, my experiments do not show any evidence of their superiority over the other products.

VII. GENERAL CONCLUSIONS.

1. The methylene radicle is transformed very readily into formaldehyd with some compounds; much more difficultly or not at all with others.

2. The formaldehyd thus liberated is completely oxidized in the human organism and does not exert any antiseptic action on the urine.

3. Formidin is neither decomposed nor absorbed to any appreciable extent in the intestine.

4. Hexamethylenamin is the only reliable urinary antiseptic (by mouth) of the various substances tried. The salicylates (sodium salicylate, salol, novaspirin) have a distinct, but much inferior, preservative effect. The following are practically useless: Boric acid, citarin, formidin, iodomuth, sodi-forma-sal, sodium benzoate and sodium phenolsulphate, tannoform, tannopin and ur-a-sol.

5. As intestinal antiseptics, the most efficient drugs appear to be bismuth subnitrate and creosote, (also novaspirin and ur-a-sol). These are closely approached by tannoform and iodomuth. Distinctly inferior are formidin, salol, guaiacol carbonate, tannopin and glutol. Guaialin appears nearly useless.

6. As relatively insoluble wound powders, the greatest antiseptic power appears to be possessed by betanaphthol, boric acid, iodoform, quinin sulphate and xeroform. These are closely approached by acetanilid, bismuth subnitrate and orphol. Somewhat inferior are chloretone, formidin, iodoform and ur-a-sol. Distinctly inferior are glutol, guaiacol carbonate, tannoform, tannopin, tannin and salol. Not antiseptic are cerium oxalate, charcoal, chalk and zinc oxid.

7. Of all the products examined for antiseptic value, hexamethylenamin is the only one which offers undoubted advantages over the older antiseptics. This statement is not intended to reflect on the antirheumatic value of the salicylic products, or on the astringent value of the tannin products.

SERUM DIAGNOSIS OF SYPHILIS.*

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The investigations of Bordet and Gengou first directed attention to the possibility of determining the presence of antibodies by an indirect method known as complement deviation. By this means not only could bacterial antibodies be determined, but likewise their corresponding antigen. (The latter term is applied to any bacterium or substance which, when injected into an organism, gives rise to the formation of an antibody.)

It was found by this method that organ extracts, albumins, peptones, etc., produce antibodies, and that this could be shown *in vitro* by bringing together the antigen and its corresponding antibody in the presence of complement. The anchoring of complement was demonstrated by failure of hemolysis to occur in an added inactivated hemolytic system.

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

Wassermann and Bruck used this method to show the presence of bacterial substances in organ extracts and corresponding antibodies in sera of patients immunized against them. They employed this method with considerable success in typhoid, tuberculosis and meningitis epidemica.

It occurred to Wassermann that this principle might be applied to demonstrate antibodies in the sera of syphilitics. With this in mind he, with Neisser and Bruck,[1] began a series of investigations.

Their first experiments were made with monkeys. They obtained immune sera by injecting into monkeys extracts of syphilitic organs or lesions procured from syphilitic monkeys or human beings. They afterward mixed the immune serum of the prepared monkey with the extract of syphilitic organs obtained from a dead luetic new-born, added complement, and found that in many instances a fixation of complement occurred, whereas it did not occur when mixed with similar extracts of normal organs nor when normal serum was mixed with syphilitic or normal organ extracts.

They looked on this as a means of demonstrating *in vitro* syphilitic antibodies in the blood serum and syphilitic substances in the organs of luetics.

The first clinical application of this method was reported by Detre,[2] who found specific antibodies in the blood of two out of six luetics he examined.

The examination of 257 specific cases in the dermatologic clinic of Breslau reported by Neisser, Bruck and Schucht[3] showed positive results in only 19 per cent. Their experiments were conducted also with a view of demonstrating antigen, which they found in extracts of blood corpuscles of luetics in a much larger percentage.

The above results have never been quite clear, as they were entirely out of accord with the results of all other investigations and likewise of Bruck's[4] later work in company with Stern.

Wassermann and Plaut[5] examined the spinal fluid of forty-one progressive paralytics and obtained a positive reaction in 78 per cent; nineteen controls, whose spinal fluid was examined, all gave negative results.

Schutze[6] examined twelve tabetics and found antibodies in the spinal fluid of eight. Morgenroth and Stertz[7] obtained a positive reaction with the spinal fluid of eight paralytics and a negative reaction with the lumbar fluid of eight control cases.

Marie and Levaditi[8] confirmed the findings of Wassermann and Plaut by reporting a positive reaction with the spinal fluid of 73 per cent. of thirty-nine paretics, four out of five tabetic paralytics, and two out of four tabetics. They had negative results in a number of controls among cases with diseases of the nervous system not depending on syphilis.

These investigations served to clinch the etiologic association of progressive paralysis and tabes with syphilis.

Although Wassermann first believed this test to be a reaction between luetic antibodies and syphilitic substances contained in the luetic organ extract, it became evident to those working with the reaction that this was not the case.

Attention was attracted to this by Marie and Levaditi, and confirmed by Fleischmann, Michaelis and others. Levaditi observed that with normal liver extract some delay in hemolysis occurred and that when the normal extract was used in larger quantities a strong anticomplement reaction occurred. A parallel anticomplement reaction was not noticed when the luetic and normal extracts were used in the same proportions.

Levaditi, however, considered the reaction, in view of his negative results in control cases, specific for syphilis.

Weil,[9] following the observation of Levaditi, attacked the specificity of the test. He experimented with extracts of tumors (sarcomas) which he used instead of luetic liver extract, and obtained a positive reaction with syphilitic sera, the same as had been obtained with extracts of normal organs when used in similar quantities. Kraus asserted that he, with Volk, had reported this observation with regard to normal organ extracts before Levaditi.

Michaelis[10] confirmed the work of Levaditi, and held the reaction specific for syphilis.

Landsteiner, Müller and Pötzl,[11] in their investigations, used extracts of guinea-pig liver as antigen. They compared the results of this in the reaction with luetic liver extract and found that they coincided.

Since it has become clearly evident that the active constituents of the extracts concerned in the reaction do not consist of luetic substances, to-wit, *Spirochaeta pallida* of Schaudinn, numerous experiments have been made and are still going on to determine their identity.

Wassermann,[12] with Porges and Meier, Landsteiner, Müller and Pötzl,[13] Levaditi and Yamanouchi,[14] independently of each other, made extracts of syphilitic and normal liver with alcohol and found that such extracts contained the antigen and served for evoking the reaction. Landsteiner used alcoholic extracts of guinea-pig heart and showed that results were obtained similar to those obtained with luetic liver extract.

This observation of Landsteiner, Müller and Pötzl is of great practical importance and will prove of immeasurable advantage in promoting the use of the Wassermann reaction because of the readiness with which guinea-pig's heart can be secured and prepared.

In view of its solubility in alcohol, Wassermann thought that the active constituent must be closely allied to the lipoid bodies. With this in mind, Porges[12] and Meier, under Wassermann's direction, experimented with lecithin and, in fact, found that it caused a deviation of complement with luetic sera.

This has led to investigations with other substances, cholesterin, glycogen, sodium taurocholate and glycocholate, vaselin, etc.

Levaditi found lecithin and the sodium salts of the bile acids to work satisfactorily. Fleischmann[15] found cholesterin more satisfactory, compared with the luetic liver extract, than the lecithin.

I have employed both lecithin and cholesterin, using

1. Wassermann, Neisser and Bruck: Deutsch. med. Wchnschr., 1906, xxxii, 745.
2. Detre: Wien. klin. Wchnschr., 1906, xix, 619.
3. Neisser, Bruck and Schucht: Deutsch. med. Wchnschr., 1906, xxxii, 1937. Wassermann, Neisser, Bruck and Schucht, Ztschr. f. Hyg., xiv, 45.
4. Bruck and Stern: Deutsch. med. Wchnschr., 1908, xxxiv, 459.
5. Wassermann and Plaut: Deutsch. med. Wchnschr., 1906, xxxii, 1769.
6. Schutze: Berl. klin. Wchnschr., 1907, lxiv, 126.
7. Morgenroth and Stertz: Virchow's Arch. f. path. Anat., 1907, clxxxviii, 166.
8. Marie and Levaditi: Ann. de l'Inst. Pasteur, 1907, xxi, 138.
9. Weil: Wien. klin. Wchnschr., 1907, xx, 527.
10. Michaelis, L.: Berl. klin. Wchnschr., 1907; lxiv, 1103.
11. Landsteiner, Müller and Potzl: Wien. klin. Wchnschr., 1907, xx, 1565.
12. Wassermann: Berl. klin. Wchnschr., 1907, lxiv, 1599.
13. Landsteiner, Müller and Potzl: Wien. klin. Wchnschr., 1907, xx, 1564.
14. Levaditi and Yamanouchi: Compt. rend. Soc. de biol., 1907, lxii, 741.
15. Fleischmann: Berl. klin. Wchnschr., 1908, lxv, p. 490

guinea-pig heart extract as control in the reaction with luetic sera. My experience is as follows:

I examined eleven syphilitic sera with extract of guinea-pig heart and with lecithin. Eleven were positive with the extract and ten with lecithin. The intensity of the reaction with the same serum varied somewhat as between the extract and lecithin. In six the reaction resulted alike. In two the reaction with extract was more marked and in two more marked with lecithin.

Seven syphilitic sera were examined with both extract of guinea-pig heart and cholesterin. Seven were positive with extract and six with cholesterin. The result of reaction was alike with both in four cases. In two cases the extract gave a more marked reaction than cholesterin.

In the search for the active chemical constituent of the extracts Sachs and Altmann[17] used sodium oleate as antigen and obtained positive reactions with syphilitic sera. Continuing their experiments, Sachs and Altmann[18] found that they could prevent the reaction between luetic sera and alcoholic extract of luetic liver by the addition of an appropriate dilution of sodium hydrate, and likewise in some instances could convert a negative reaction between normal sera and luetic extract into a positive reaction by the addition of properly-diluted hydrochloric acid. They came to the conclusion that either syphilitic sera differentiate themselves from other sera by a lessened alkalinity, or that (which they considered more likely) the special quality of the syphilitic sera is to be sought in another factor, for the reaction of which, with the lipoids, the diminished alkalescence is necessary.

Following close on the experiments with lecithin as antigen in the syphilis reaction, Porges,[19] in company with Meier, worked out a modification of the serum diagnosis for syphilis. They found that luetic or metaluetic sera precipitated lecithin from solution. The test consists in mixing equal parts of a 0.2 per cent. suspension of lecithin in distilled water and serum of a suspected patient in a test-tube and incubating for five hours. If it is a syphilitic serum, a flocculent precipitate forms. Kraus, in discussing the subject at the time, asserted that the specificity of the Porges test was supported by the experiments of Eisler. Nobl and Arzt[20] shortly thereafter published their results of the Porges reaction. They examined eighty-three cases and found a positive reaction in 81 per cent. of them.

Fritz and Kren's[21] investigations of the Porges reaction showed that while it was positive in 63 per cent. of fifty-one cases of manifest syphilis, it was also positive in 65 per cent. of seventeen cases of tuberculosis of the lungs and skin that they examined. Using sodium glycocholate in place of lecithin in twenty-six cases of syphilis they obtained positive results in 65 per cent., while they obtained only 18 per cent. of positive reactions with this salt in tuberculosis.

The complete shattering of the specificity of this test is found in the report of Eisler,[22] whose results Kraus[23] had apparently misinterpreted when he quoted them as sustaining the specificity of the Porges reaction. Eisler reports that precipitating and non-precipitating animal sera give the lecithin but not the Wassermann reaction, and that sera of tuberculosis cases give it in about the same proportion as cases of syphilis.

Porges and Meier[24] have recently published the results obtained in the examination of 100 syphilitic sera by means of the watery extract, the alcoholic extract of luetic liver, the lecithin suspension and by their method of precipitation with lecithin. They found the results of the lecithin reaction to run parallel to those obtained by the complement fixation method.

Another modification in the serum diagnosis of syphilis was presented by Klausner,[25] who reported that on mixing one part of serum with three of distilled water and allowing it to stand at room temperature a flocculent precipitate formed in from one to fifteen hours.

In a subsequent report by Klausner[26] he states that in his controls he obtained positive reactions in five severe lupus cases, five typhoid cases and three cases of pneumonia. The reaction depends on the precipitation of globulin which is increased in infectious diseases. It would seem to lack specificity for syphilis.

Parallel tests carried out by me with the Wassermann, Porges, and Klausner reactions gave the following results in nine cases of syphilis:

	+	−
Wassermann reaction	9	0
Porges "	6	3
Klausner "	2	7

Although we are apparently closer to a solution of the theoretic basis of the Wassermann reaction, any final statement at this time would seem, from the experimental results so far recorded, unwarranted.

It would appear from the evidence at hand that there is some substance in the sera of syphilitics not contained in non-syphilitic sera which has an avidity for certain substances contained in luetic and normal organs, and also in guinea-pig organs, and for certain lipoid bodies, as lecithin, cholesterin, etc. (Wassermann).

After this extended consideration of the development and theoretic basis of the serum reaction I shall take it up in its practical aspect.

The specificity of the test is a matter of paramount importance from a practical standpoint. Fortunately the statistical proof now before us from different and reliable sources is sufficient to establish the specific character of the reaction.

In practically every case the controls examined by various investigators have proved negative. Even Weil, who attacked the specificity of the reaction in the first instance, and later with Braun the specificity of the antigen, was not able to secure the reaction with non-syphilitic sera. At the same time their results with syphilitic sera bespeak its specificity.

Following are some of the results of examinations recorded:

DETRE[27] obtained positive reactions with the sera of 2 out of 6 luetics.

WASSERMANN AND PLAUT[28] examined the spinal fluid of 41 paralytics; 78 per cent. of the reactions were positive. They also examined 19 controls; findings all negative.

MORGENROTH AND STERTZ[29] examined the spinal fluid of 17 paralytics and metasyphilitics; 53 per cent. of the reactions were positive; in the spinal fluid of 8 controls, the findings were negative.

MARIE AND LEVADITI[30] examined the spinal fluid of 39 progressive paretics; 74 per cent. of the reactions were positive;

17. Sachs and Altmann: Berl. klin. Wchnschr., 1908, lxv, 404.
18. Sachs and Altmann: Berl. klin. Wchnschr., 1908, lxv, 699.
19. Porges: Wien. klin. Wchnschr., 1908, xxi, 206.
20. Nobl and Arzt: Wien. klin. Wchnschr., 1908, xxi, 287.
21. Fritz and Kren: Wien. klin. Wchnschr., 1908, xxi, 386.
22. Eisler: Wien. klin. Wchnschr., 1908, xxi, 422.
23. Kraus: Wien. klin. Wchnschr., 1908, xxi, 206.
24. Porges and Meier: Berl. klin. Wchnschr., 1908, lxv, 731.
25. Klausner: Wien. klin. Wchnschr., 1908, xxi, 213.
26. Klausner: Wien. klin. Wchnschr., 1908, xxi, 365.

in 5 tabetic paralytics, 80 per cent. of the reactions were positive.

CITRON[27] examined 108 cases of evident or suspected syphilis; 74 per cent. of the findings were positive.

FLEISCHMANN AND BUTLER[28] examined 41 syphilitics and suspected luetics; in 70.7 per cent. of the cases the findings were positive.

MICHAELIS[29] examined 12 cases of certain and suspicious lues; 75 per cent. of the reactions were positive; of 23 controls, 2 reactions were positive.

M. WASSERMANN AND MEIER[29] examined 39 suspicious cases; 69 per cent. of the reactions were positive.

SCHUTZE[4] examined 12 cases of tabes; 75 per cent. of the reactions were positive.

FISCHER AND MEIER[30] examined 114 syphilitics; 83.7 per cent. of the reactions were positive.

MEIER[31] examined 118 cases of lues; 81.7 per cent of the reactions were positive; in 21 controls all the findings were negative.

KRONER[32] examined 40 cases of suspected lues; 75 per cent. of the reactions were positive; in 10 controls all the findings were negative.

MÜHSAM[33] examined 80 cases; obtained positive results in 48. All of the latter proved syphilitic by examination or as the result of treatment.

KAREWSKI[34] examined 18 suspected cases; the reactions were all positive.

WEIL[7] examined 9 luetics; 88 per cent. of the reactions were positive.

WEIL AND BRAUN[35] examined 15 metasyphilitics; 80 per cent. of the reactions were positive; of 7 controls all the findings were negative.

MICHAELIS AND LESSER[36] examined 63 syphilitics and suspected syphilitics; 74 per cent. of the reactions were positive.

MÜLLER[37] examined 197 cases of syphilis; 94 per cent. of the reactions were positive; of 500 controls 97 per cent. of the reactions were negative.

BLASCHKO[38] examined 270 luetics; 87 per cent. of the reactions were positive.

The varying percentage of positive reactions obtained depends on the class of cases examined. In the statistics of some writers, cases with manifest symptoms dominate; in others, metasyphilitic and latent cases make up a good share.

The uniformly negative reaction found in controls and the large percentage of positive reactions in luetic and suspiciously luetic cases not only establish the specificity but likewise the reliability of the test.

On these two points the clinical value of any blood test depends, and when they have been fulfilled, as with the serum diagnosis of syphilis, it is evident that its clinical value is settled as a diagnostic test.

Right here attention should be directed to what a positive reaction implies and what may be interpreted from it. A positive reaction only indicates that the patient has syphilis, whether acquired or inherited. Whether or not this systemic infection is the cause of a pathologic change in some organ or tissue must of necessity be learned from other clinical facts. In other words, a positive reaction may be valued as an indication of systemic infection and not used decisively in making specific organ diagnosis.

Unfortunately the performance of the reaction itself is attended with difficulties which may discourage many who undertake it. Some of these difficulties have been removed by the employment of alcoholic extracts, as the watery extracts were decidedly unstable.

The substances employed in the reaction and their preparation are as follows:

1. *Blood Serum of Suspected Luetic.*—This is obtained as follows: Collect blood from the vein or finger, allow it to clot; remove the separated serum; centrifugate to clearness; pipette off into test-tube, and inactivate at 56 C. for one-half hour.

2. *Organ Extract.*—Take luetic liver or guinea-pig heart and rub up fine with sand in mortar, add 95 per cent. alcohol in proportion of 50 c.c. to one gram of guinea-pig heart. Place in flask and heat in water bath at 60 C. for an hour. Filter through paper filter and keep at room temperature ready for use.

3. *Complement.*—Guinea-pig serum is used. Collect blood from heart of guinea-pig in sterile flask; allow to coagulate and remove the separated serum. Keep on ice ready for use.

4. *Hemolytic Serum.*—Inject a 5 per cent. mixture of washed sheep's-blood corpuscles into a rabbit every week or ten days for four or five times. A week or ten days after the last injection the blood may be removed from heart, serum collected, inactivated, and kept on ice ready for use.

5. *Washed Sheep's-Blood Corpuscles.*—Sheep's blood is obtained from the jugular of a sheep in a sterile flask and defibrinated by glass pearls. It is washed with salt solution two or three times and then mixed with salt solution either in the proportion of 5 per cent. or 50 per cent., according as one adheres to the cubic centimeter plan or drop method for measuring quantities.

As the serum reaction is usually performed, all constituents of test are calculated in fractions of a cubic centimeter and the quantities so diluted with salt solution that each cubic centimeter of dilution represents the desired quantity.

The suggestion of Landsteiner, Müller and Pötzl greatly simplifies this method and takes far less material. They measure the proportion of ingredients to each other by drops.

Before the actual performance of a reaction it is necessary to test material to be used:

1. To standardize the amboceptor.
2. To see that extract alone does not bind complement, or hemolyze sheep's corpuscles.
3. To see that the blood corpuscles have not hemolyzed.
4. To see that the complement is active.

The standardizing of amboceptor is effected by determining what dilution of amboceptor in a drop dose will dissolve in a half hour in an incubator one drop of 50 per cent. suspension of sheep's corpuscles with one drop of complement; a definite amount of salt solution, ten drops, is added as diluent. Twice the strength of this is used in test.

It is desirable to test the extract before each reaction is undertaken to see that it alone does not delay the hemolysis. With this point in view, a drop of extract and one of complement, in ten drops of salt solution in test-tube, are incubated one-half hour and then amboceptor and blood corpuscles are added. Hemolysis should occur within a half hour.

If the blood corpuscles have stood for some days they may have hemolyzed, as may be judged by color of supernatant fluid.

Complement should not be used after the third day.

When all ingredients used in the test are suitable the

27. Citron: Deutsch. med. Wchnschr., 1907, xxxiii, 1165.
28. Fleischmann and Butler: THE JOURNAL A. M. A., 1907, xlix, 934.
29. Wassermann, M., and Meier: Deutsch. med. Wchnschr., 1907, xxxiii, 1287.
30. Fischer and Meier: Deutsch. med. Wchnschr., 1907, xxxiii, 2169.
31. Meier, G.: Berl. klin. Wchnschr., 1907, xxxiii, 1636.
32. Kroner: Berl. klin. Wchnschr., 1908, xxxiv, 149.
33. Mühsam: Berl. klin. Wchnschr., 1908, xxxiv, 14.
34. Karewski: Berl. klin. Wchnschr., 1908, xxxiv, 15.
35. Weil and Braun: Berl. klin. Wchnschr., 1907, xxxiii, 1572.
36. Michaelis and Lesser, F.: Wien. klin. Wchnschr., 1908, xxi, 289.
37. Müller: Wien. klin. Wchnschr., 1908, xxi, 282.
38. Blaschko: Berlin klin. Wchnschr., 1908, xxxiv, 694.

performance of the reaction is facilitated and never disappointing.

It is necessary to introduce a few known syphilitic sera and at least as many normals in every test, these serving as controls for suspected sera.

In performing the reaction each serum is tested with and without the extract to see if in the first instance the combination inhibits the hemolysis, and in the second instance that the serum alone does not do so.

Occasionally the serum alone will hasten the hemolysis over the control in which the complement, amboceptor and blood corpuscles are contained, because of the fact that some sera possess a slight amount of amboceptor for sheep's blood corpuscles (Michaelis[10]).

The performance of the reaction is as follows:

For each serum two small test-tubes are required and several tubes for controls of the materials as above, these being repetitions of the tests of material made before beginning the reaction. Add ten drops of salt solution to each tube. Add a drop of serum to each of the two tubes used for a given serum. Then add two drops of organ extract to one of them. To one of the control tubes add two drops of organ extract. To all add a drop of complement. Shake tubes and place in incubator for one hour. Remove and add a drop of standardized amboceptor and one drop of 50 per cent. suspension of sheep's blood corpuscles. Incubate for an hour and a half and then read the result. All controls with sera alone, with normal sera, and with organ extract alone, should be hemolyzed. If in tubes containing suspected sera and organ extract hemolysis has occurred they are regarded as negative. Those containing sera and organ extract, in which hemolysis has not occurred at all or only incompletely, are positive.

Uncertainties not infrequently arise in reading the result of reaction. These are invariably traceable to a failure to test materials used in the reaction, failure of sufficient controls on the material, or of control sera, both syphilitic and non-syphilitic.

I have examined 125 cases. Twenty of these were controls in which syphilis could be, from examination and history, reasonably excluded. Among the control cases were typhoid, pneumonia, neurasthenia, etc., all of which reacted negatively.

Various classifications are used in reporting cases by different authors. I have grouped mine under two main heads, with subdivisions. These include:

First, cases with manifest or suspected syphilis and cases giving a history of syphilis.

Second, cases with lesions of the nervous or cardiovascular systems in which syphilis was either acknowledged, denied, suspected or unsuspected.

Of the first division there were 61 cases.

1. There were in the primary stage, either with initial lesions or before appearance of secondary symptoms, 4 cases; four positive.

2. In the secondary stage were 25 cases; 24 positive, 1 negative.

3. In the tertiary stage were 17 cases; 16 positive, 1 negative.

Of latent cases there were 15; 8 positive, 7 negative.

In the second division there were 44 cases; positive reaction in 75 per cent. Forty per cent. of these either had no knowledge of infection or denied same.

CLASS 1.—Taking up the first group of cases it will be observed that of the cases with luetic manifestations, forty-six in number, 93 per cent. gave a positive reaction. This coincides closely with the recent publications already cited for this class of cases. Some variations in percentages will necessarily result because of the method of classification used by different authors, some of whom have classed metasyphilitic cases among the syphilitic with manifest symptoms, for which there is undoubtedly much justification, in view of the recent light thrown on the subject by this test.

Of interest to the syphilologist is the result of this reaction in the primary stage. In a large percentage of cases with the initial lesion, this reaction is found positive. This is of great value, not only in analyzing a venereal infection, to-wit: chancroid with possible chancre, urethral chancre, etc., but it is of immense advantage from a therapeutic standpoint, deciding the diagnosis in many instances at once, in case any doubt existed from a point of view of clinical diagnosis and indicating the therapeutic course.

Attention should be directed to the advantage of this test in syphilophobia.

Of the latent cases, fifteen in number, 54 per cent gave a positive reaction. This forms one of the interesting phases of the syphilis question developed by this reaction. Some of these patients, which number among them those that have been well treated and others indifferently treated, have been free from symptoms for a number of years.

The question whether the latent cases that are negative to the reaction may be regarded as safe and whether those that give a positive reaction are in danger of a recurrence, is of great practical importance and at the same time presents difficulties of solution not easily overcome at this time.

Recently Fleischmann[15] has reported three cases that did not give the reaction, but in which the patients within a few months had a recurrence of symptoms. He does not state how long it was from the time of the initial lesion.

The following interpretation of a negative result of the test may be considered as according with our present knowledge. The absence of reaction, even when symptoms are lacking, does not necessarily mean that the patient is cured, but simply that his infection is quiescent, but it gives no assurance beyond this point.

While it may be rash to express an opinion as to the existing anatomic condition or destiny of latent cases, free from symptoms for a number of years, which give a positive reaction, the following statement of Lesser, made a number of years ago and recently quoted by Blaschko,[28] may be of some interest and also of value. Lesser stated that certain diseases occur in late syphilis, besides the so-called tertiary manifestations, which are not exactly to be reckoned in the gummatous affections, diffuse changes which develop slowly in apparently healed luetics and which also under circumstances can lead to death. He was able to find in about 9.5 per cent. of all autopsies, investigated by him, signs of such specific disease processes, which during life had produced no symptoms or at least were not generally diagnosed as syphilis, viz.: aortitis, etc.

On statistics collected by Blaschko and Jacobsohn, Lesser estimated that about 20 per cent. of the male population of Berlin were infected with syphilis and he maintained that the 9.5 per cent. which had shown evidences of specific processes, postmortem, represented 50 per cent. of those earlier infected with syphilis. Blaschko and Jacobsohn, from a study of insurance statistics, came to the conclusion that in one-third of the cases of syphilis, death could be traced to the disease. In luetics, therefore, syphilis is a cause of death

in about 33 per cent. of the cases; but there are demonstrable changes in the organs of dead luetics in 50 per cent. of the cases, which latter percentage coincides with the percentage of positive reactions found in latent cases of syphilis.

While it would be unjustifiable at this time to draw any conclusions from this coincidence, it would seem a safe proposition that cases which give a positive reaction, even though they may not show evident manifestations, should receive serious consideration for treatment, because, irrespective, of the above statements of Lesser, it is observable in a certain proportion of the cases that a diminution or disappearance of the reaction will occur under treatment. Just what the latter indicates at this time with regard to cure or abeyance of the infection, no one is prepared, supported by statistics, to state.

Fleischmann and I in our first communication on this subject made note of the observation that the reaction failed in some cases under anti-specific treatment and in others that had been previously well treated, thus coinciding with Citron's observations. On the other hand we examined cases under similar circumstances that gave the reaction.

Müller[27] and Blaschk[28] and also Citron found a disappearance or diminution of the reaction in a third of their cases under treatment. In this matter the factor of time must be of importance; one patient may require a much more prolonged treatment (as is the case clinically with regard to disappearance of symptoms) to bring about a negative reaction, than is needed in another case.

This point has apparently not received any attention, namely, that the factor of time is not defined as it should be in estimating the effect of treatment on the reaction.

Just what effect antiluetic treatment may have on a patient to influence the serum reaction is a matter of conjecture.

While examining sera I tried to determine the effect of a 1-10,000 mercuric chlorid solution on various substances used in the reaction. No effect was produced on complement, amboceptor, or blood corpuscles in whatever combination used. It exerted anything but a uniform action where it was used in the reaction with the extracts.

This may be best shown by presenting results of examinations by extracts without and with mercuric chlorid solution.

The results only are recorded under headings "extract" and "extract and mercuric chlorid solution." The number of + signs express the intensity of the reaction. I have included results of examinations with lecithin and cholesterin.

Extract.	Cholesterin.	Extract + Mercuric Chlorid Sol.
2+	1+	3+
1+	1+	—
3+	—	—
4+	2+	2+
1+	1+	1+
1+	1+	2+
2+	2+	—
	Lecithin.	
2+	1+	—
1+	1+	1+
1+		—
4+	4+	4+
1+	2+	—
1+	2+	1+
1+	1+	1+
1+	1+	1+
3+	2+	1+
3+	3+	3+
3+	3+	—

Reaction with extract and mercuric chlorid solution equal to reaction with extract alone 7 times.

Reaction with extract and mercuric chlorid solution stronger, 2 times.

Reaction with extract and mercuric chlorid solution weaker, 2 times.

Reaction with extract and mercuric chlorid solution abolished, 7 times, whereas with extract from 1+ to 3+.

Mercuric chlorid solution abolished the reaction in 39 per cent. of cases.

Class 2.—Following is a synopsis of the diagnosis and result of reaction:

a. Brain syphilis, 5 cases: All gave positive reaction; two of these denied luetic infection.

b. Cerebrospinal syphilis: 1 case gave positive reaction; patient gave history of lues.

c. Hemiplegia, 9 cases: 7 gave positive reaction, 2 negative. Six patients gave history of specific infection, 5 of whom gave a positive reaction. Two (no specific history obtainable) gave a positive reaction. One denied infection and gave a negative reaction.

d. Spinal lues, 3 cases: 2 gave a positive reaction. One of these denied infection. The third patient gave history of infection. Reaction was negative.

e. Transverse myelitis: The patient in one positive case acknowledged syphilis; in one negative case the patient denied infection.

f. Case of uncertain diagnosis in which the patient gave a history of syphilis proved positive to the test.

g. Tabes, 15 cases: 8 gave a positive reaction, 7 a negative. In the positive cases 7 patients acknowledged lues, 1 denying it. In the seven negative cases 2 patients gave history of syphilis, 1 denied infection. From history of 3 others previous infection was strongly probable. In 1 no record was obtainable.

h. Epilepsy, 2 cases; in women, developed in middle life; the reaction was positive.

i. Neuritis, 3 cases: Two of the patients denied syphilis. All gave a positive reaction.

j. Vascular disease, 5 cases: All gave positive reaction. One of these with intermittent claudication, denied lues.

In the tabes cases examined by me the percentage of positive reactions is somewhat low. This class of cases, and likewise many of the other metasyphilitic cases that gave a negative reaction, are so often subjected to antiluetic treatment that it is more than probable that this is the cause of failure of reaction in some of them. Schutze found eight of twelve cases of tabes positive; Citron[27] reported thirteen of fifteen cases and Fleischmann[13] thirteen of eighteen cases positive.

A detailed consideration of cases is deemed impractical in this brief paper.

CONCLUSIONS.

The serum reaction for syphilis is specific.

It is found positive in from 90 per cent. to 95 per cent. of all cases with syphilitic manifestations.

It is found positive in 50 to 60 per cent. of latent cases.

It is found positive in from 70 to 80 per cent. of parasyphilitic diseases.

The reaction is in many cases influenced by treatment of the patient and it is not improbable that this number would be greatly increased if the reaction were pursued throughout prolonged treatment.

A positive reaction indicates activity of the specific virus, and is an indication for antisyphilitic treatment.

While a positive reaction indicates syphilis, a negative reaction does not have an equal negative value.

It is diagnostic of a systemic infection whether acquired or inherited and not an organ diagnostic measure.

The reaction will be found of enormous advantage in differential diagnosis in every department of medicine.

DISCUSSION.

Dr. Karl K. Koessler, Chicago: Dr. Butler says that it makes no difference whether the reaction is made with syphilitic organ extract, with an alcoholic extract of a normal rabbit's heart, or with lecithin, according to Porges and Meier. I can not confirm his opinion. Although the Porges-Meier reaction is said to work with lecithin only, researches made in this line at Vienna have shown that results are obtained in only 45 per cent. of cases, while the Wassermann reaction gives about 90 per cent. The Porges-Meier method, however, involves quite a different principle from Wassermann's, being a precipitin reaction having nothing to do with the deviation of the complement. Any one who, like Dr. Butler, has worked out a great many cases, knows what a long process Wassermann's method is. Certainly it would be much simpler to use the alcoholic extract instead of the syphilitic; but comparison between positive results in each method gives preference to the original procedure of Wassermann. It is perhaps better, in accord with Levaditi's modification, to use a dried extract of the liver of a syphilitic fetus, in order that it may be preserved and a solution made when needed. On account of the enormous responsibility for the physician in making the diagnosis of syphilis he should use the method which gives the greatest number of reliable results and in uncertain cases repeat the test three times at intervals of ten days and make the positive diagnosis only within the month.

Dr. William J. Butler, Chicago: Time would not permit the reading of that part of the paper referring to the Porges-Meier reaction. I used the Porges reaction in a small number of cases and compared it with the Wassermann and the Klausner reactions. Recent investigations show that it is not specific, because it is found that tuberculosis will give a positive reaction in about as large a number of cases as will syphilis. I did not find it positive as often as I did the Wassermann reaction in the cases of syphilis in which I used it. I notice, however, that Porges and Meier in a recent publication have compared the Wassermann and lecithin reactions and report almost as many positives with the latter as with the complement fixation method.

As to the relative value of alcoholic and salt solution extracts, Wassermann contends that the latter extracts give a more reliable reaction than the alcoholic. I can not say that in my own observation I have had an opportunity to compare the aqueous saline solution and the alcoholic extracts with the same sera; but it seems to me, comparing my previous experience with the aqueous extract, that the alcoholic works as well as the salt solution and it has the immeasurable advantage of being stable. I do not know of anything more difficult than to work with the salt solution extracts. They are most unreliable; sometimes in a few hours, or over night, a large quantity of liver extract will go wrong and be useless. Every test made is controlled by a series of normal and syphilitic sera. The use of these controls obviates any chance of error. If under these circumstances a suspicious serum is found positive, it can be said without hesitancy that the patient has syphilis.

THE NATURE AND THE CAUSE OF EDEMA.*

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INTRODUCTION.

The remarks that follow represent one of the possible applications of a principle which for some time past I have been interested in establishing experimentally, namely, that in the variable affinity of colloids for water we have the explanation of many of those physiologic phenomena which are characterized by a storage or a migration of water.[1]

If we ignore certain "vitalistic" conceptions of edema in which fantastic properties of "living" cells are supposed to account for the phenomena observed, the increased amount of water held by tissues in a state of edema is usually attributed to "changes in blood pressure," and to "alterations in the permeability of vessel walls." The alterations in the permeability of vessel walls have never been demonstrated experimentally, and all efforts to produce states of edema through simple increase in blood pressure have failed. The slight edema observed by some investigators after prolonged intravenous injections at high pressure of enormous amounts of various liquids can be explained more easily by changes brought about in the colloids than through simple pressure effects.

Here and there one meets a phrase in the discussion of edema which suggests that the author at least assumes the possibility of a cause for this condition in the tissues themselves, but I know of no experiments planned to actually prove this point, or of any attempts to define the nature of these tissue changes physico-chemically, except those of Jacques Loeb,[2] who, ten years ago, tried to find in an increase in the osmotic pressure of the tissues the cause of the increased absorption of water. The inadequacy of this explanation has since become apparent, but the experimental facts adduced by this author to show that the cause of edema resides essentially in the tissues are of permanent value, and should have received a recognition at the hands of pathologists which has never been accorded them.

THE CAUSE OF EDEMA RESIDES IN THE TISSUES.

For a starting point in our discussion it is well to take the results of some experiments which prove conclusively that the cause of edema resides primarily in the tissues. When this is proved we can say that tissues become edematous not because water is forced into them, but because they absorb water from liquids flowing through or about them. An analysis of the changes in the tissues leading to the increased absorption of water may then be attempted.

My experiments consisted in passing a ligature about one hind leg of a frog or a toad sufficiently tightly to close both the veins and the arteries of that leg, and then placing the animal in a vessel containing enough water to cover the legs. A ligature placed just above the knee where lack of musculature makes ligation of the vessels an easy matter proved most satisfactory. In such an entire absence of the circulation the ligated leg begins to swell and in the course of a few days develops an intense edema. The edema is well marked at the end of twenty-four hours, and in two or three days the weight of the ligated leg may come to be almost twice that of the unligated leg.

The picture presented by the edematous legs is a duplicate in every way of the most intense states of edema observed clinically. The tissues are boggy, pit on pressure, and when incised allow the escape of fluid. If the ligature is left in place for two to three days small vesicles form which may enlarge into great blebs con-

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* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. Fischer, M. H.: Physiology of Alimentation, New York, 1907, pp. 268, 182-187, and 267-269. Fischer, M. H., and Moore, Gertrude, Am. Jour. Physiol., 1907, xx, 330.

2. Pflüger's Archiv. für die gesammte Physiologie, 1898, lxxi, 468.

taining a blood-stained serum.[3] Later, these blisters rupture and allow the escape of their contents, and the weight of the ligated leg diminishes. This progressive diminution in weight continues due, in part, to loss of substance, in part to changes which no longer allow the leg to hold the large amount of water it once held,[4] until finally the ligated leg weighs no more than the unligated. If the animal is kept sufficiently long (two to three weeks) the ligated leg is lost entirely (gangrene).

The increase in the weight of the ligated leg is entirely due to the absorption of water. This water is held in the skin, in the tissues composing the body of the leg—chiefly the muscles—and in the lymph spaces found between the skin and the underlying tissues. With this third division must be mentioned the fluid found in the blisters, which it is well to point out, in passing, are formed in the body of the skin.

As is to be expected, the development of an edema in the ligated leg of a frog or a toad kept in a little water will occur when the animal has been pithed just as well as in the normal animal, but if the frog or toad is killed, the difference in the weight of the two legs does not appear. This is not, however, because the edema does not develop in the ligated leg, but because it develops equally well in the other leg (which has through the death of the animal been deprived of its circulation). Herein is found the explanation of the fact that the tissues of dead bodies which are kept in water swell.

An objection which is likely to be lodged against my experiments is that I did not tie the ligatures sufficiently tightly to shut off both veins and arteries. That this was accomplished is proved by the fact that if the frog or toad was kept in a dry vessel the ligated leg soon dried so as to become brittle, while the unligated leg remained moist.

CHARACTER OF THE TISSUE CHANGES IN EDEMA.

It is clearly shown by these simple experiments that the severest grades of edema may exist without the presence of any "blood pressure" or a demonstrated "increased permeability of blood vessel walls." I shall try to show now that edema represents nothing but an increased affinity of the tissue colloids for water. Such an increased affinity of the colloids may be brought about in either or both of the following ways: *First*, in conditions leading to edema, various substances (particularly acids) capable of greatly increasing the affinity of colloids for water are not removed as they should be or are produced in abnormal amounts, and *second*, colloids having but little affinity for water are changed into such as have a greater affinity.

The first of these two factors plays the predominant rôle and is the only one discussed in this paper. We may regard it as settled that the amount of water held by a tissue under normal circumstances is essentially a function of its colloidal constitution for the same external circumstances which make certain so-called hydrophilic colloids either take up or give off water, make animal tissues do the same.[5]

If, now, the conception of edema as a condition in which this affinity of the tissue colloids for water has been abnormally increased is correct, it must be possible to prove three things: (1) That protoplasm is colloidal in constitution. (2) That in the variable affinity of colloids for water we have a force of sufficient magnitude to account without strain for the maximum amount of water ever found absorbed by tissues in a state of edema. (3) That conditions leading to an increased affinity of their colloids for water exist in the tissues under circumstances associated with the development of an edema. We shall briefly consider each one of these.

1. Since the classical researches of Hofmeister, Pauli, Hardy and a few others, it is no longer questioned by any one that protoplasm represents a colloidal solution in which may be found embedded or dissolved a greater or smaller amount of extraneous material that need not be directly connected with the vital activities of the cell. Since colloids may, however, exist in several states, it is well to decide in which they are present in the cells. For our purposes it is best to distinguish between such colloids as have the power of swelling when placed in water (the so-called hydrophilic colloids) and such which do not possess this property. Many reasons can be adduced to show that protoplasm represents essentially a mixture of several hydrophilic colloids. Not only do dried albumin, fibrin, gelatin, etc., swell when placed in water, but a direct analogy can be proved to exist between the swelling of muscle, for example, and fibrin. The same conditions which make fibrin either take up or lose water, make frog muscle do the same.[5]

2. It must now be shown that in the affinity of colloids for water we have a force of sufficient magnitude to account without strain for the maximum amount of water ever found to be absorbed by tissues in a state of edema. This can be done very easily. The severest edemas found in frogs no more than double the weight of the normal leg. Some observations made on patients indicate that the severest states of human edema give values which lie far below this.

We will now, for the sake of argument, neglect the inorganic constituents of the tissues, and say that three-fourths of the body represents water, and only one-fourth various organic substances. These organic substances belong almost all of them in the group of the colloids. On the basis of the figures which I have just given, 1 gram of dry body substance would therefore equal 4 grams of moist body substance, and this in a state of edema may absorb enough water to double in weight, that is weigh 8 grams. In terms of the dry weight of the body, the colloids are therefore required to absorb in a state of edema, seven times their weight of water. It will be sufficient evidence to show how easily colloids accomplish such an absorption of water when I use as an illustration the amount of water that fibrin will absorb under appropriate circumstances. In a weak solution of acid or alkali, dry fibrin may absorb from 20 to 40 times its weight of water.

3. Lastly, it must be proved that in conditions leading to edema substances are formed which are capable of increasing what we may call the normal affinity of the tissue colloids for water. Various substances are capable of markedly influencing the amount of water held by a hydrophilic colloid.

With the exception of alkalies, we find that acids, including carbon dioxid, are the most powerful substances thus far known for increasing the affinity of colloids for water, and it is in either the retention or the abnormal

3. A circulatory system and the pressure of circulating liquids have therefore, nothing to do with the formation of blisters. The necessary elements for the formation of such pathological structures reside entirely in the tissues themselves.

4. The tissues of the leg undergo autolysis. In consequence colloids having a great affinity for water are changed into such as have a lesser affinity, or they may be reduced even to crystalloids.

5. Fischer, M. H., and Moore, Gertrude: Am. Jour. Physiol., 1907, xx, 330

production of acids in the tissues as rendered possible in conditions leading to an edema, that I see the chief cause for its development. To illustrate how powerfully a little acid modifies the amount of water absorbed by a colloid, we need only recall the fact that while fibrin will scarcely swell sufficiently in distilled water to double its weight, it will hold twenty times its weight of water if a little acid is added.

The production of acids in conditions leading to edema has been shown repeatedly. In the described experiments in which one leg of a toad or a frog is ligated, the acid reaction of the tissues may be sufficiently pronounced to evidence itself with the use of any of the common indicators. In some analyses of various edema fluids made in Prof. Friedrich Müller's clinic in Munich I found that these always showed an acid reaction toward phenolphthalein, even after the carbon dioxid contained in them had very largely been allowed to escape. We know, moreover, from Hoppe-Seyler's analyses that edema fluids contain various acids—lactic, valerianic, succinic, butyric—from Strassburg and Ewald's accounts that their carbon dioxid tension is far above that of ordinary venous blood and from Araki's studies that in conditions associated with a lack of oxygen—just such a state as is produced through circulatory disturbances—organic acids are produced in excessive amounts. Ranke's observation that a muscle after exercise absorbs more water than a resting one, coupled with the fact that acids are produced during muscular activity, also finds a ready explanation through changes brought about in the state of the colloids and lends support to the ideas advanced here.

CONCLUDING REMARKS.

It may not be amiss, in conclusion, to point out a number of facts which in a sense are corollaries of what has been said. Attention has already been called to the fact that dead bodies kept in water become edematous. This is due to the fact that after death the tissues become acid, and absorb water from their surrounding medium. For the same reason gangrenous tissues swell if a source of water is furnished them either from without or through the blood and lymph vessels. In gangrene due to occlusion of a vein it is well-known that the tissues are ordinarily moist and swollen, while a gangrene due to occlusion of an artery is ordinarily dry.

The conception of edema offered here holds for local as well as generalized edemas. In fact, one form of local edema furnishes what amounts to experimental proof of the ideas advanced. Reference is made to the rapidly developing edema which follows the stings or bites of various animals capable of carrying formic or other acids into the wound produced by them. Formic acid is exceedingly active in increasing the affinity of various colloids for water. This explains why its introduction into the tissues—as through a flea bite—is followed by such a rapidly developing local edema. That circulatory disturbances are not primarily responsible in this case is indicated very clearly by the fact that the edematous tissues are initially white and only after resolution has commenced does an increased flow of blood occur through them. "Flea bites" can, in fact, be perfectly mimicked with a needle, a little formic acid and a hydrophilic colloid. If a gelatin plate is pricked with a needle dipped into formic acid, and a little water poured over the gelatin plate, wheals soon develop on the surface of the gelatin, which, in shape and in the rate of development, are identical with those which follow the bite of a flea or the prick of a formic-acid-laden needle in the skin of a human being.

As another form of local edema which finds a ready explanation on the basis of the ideas advanced here, we may mention glaucoma, and the imbibition of water by the crystalline lens. Even if we do not accept the view that no circulation whatsoever occurs through the vitreous and aqueous humors, we must at least admit that a well defined circulation as maintained through blood and lymph vessels is difficult to demonstrate experimentally. Workers on the eye have therefore been unable to find the explanation of glaucoma in any disturbances in the pressure, *per se*, of circulating fluids; and no attempt has ever been made to account for the absorption of water by the crystalline lens, for here the absence of a circulation is only too apparent. The facts observed are, however, easily explained when it is remembered that the humors of the eye and the crystalline lens represent typical colloidal bodies and that not alone the production of the slightest amount of acid or an accumulation of carbon dioxid, even a mere decrease in the absolute or a slight shifting of the relative concentrations of the various salts found in these substances is followed by so great an absorption of water that the severest grades of clinical glaucoma are easily accounted for.

I wish, finally, to say a word regarding the active or passive migration (diapedesis) of the formed elements of the circulating fluids into the tissues. My reason for bringing up this point at this time is because in the later stages of edema the red blood corpuscles frequently pass over into the tissues, and I would like to protest against the present generally accepted belief that the red blood corpuscles, for instance, pass out of the blood vessels through so-called stomata. Such an idea, is, on its very surface, gross, if not absurd, for how can such holes exist in the blood vessel walls? The histologic evidence of their existence is entirely inconclusive. I would like to call attention to a property of colloids which allows a ready explanation, not only of the passive passage of such formed elements as the red blood corpuscles through the walls of the blood vessels, but also the active movements of the ameboid cells. It is perfectly possible for one colloid to pass through another without losing its identity or leaving any mark behind indicative of its passage. The passage of a liquid body through a colloid can be very nicely illustrated by the movement of a mercury drop through a solidified gelatine of the proper concentration. Under the influence of gravity a mercury drop will move anywhere through a gelatin mass, in which, of course, there are no stomata, and leave no evidence of its passage behind. Similarly red blood corpuscles can, under the influence of a pressure not exceeding that in the blood vessels, be blown into a stiffened gelatin. Here one colloidal body moves through another. Whether one such body will pass through the other is simply a matter of relative surface tensions. Under ordinary circumstances this relation is not such in the body as to allow the red or white blood corpuscles to pass into the tissues (we might say be swallowed), but in lack of oxygen, under the influence of chemical agents (chemotaxis), etc., the proper ratio may be produced.

For the same reason that red and white corpuscles are capable of passing into and through the tissues, bacteria may be taken up by either fixed or motile cells.

Pathologists have often wondered how a bacterium may enter the tissues at one point, and leave behind no evidence of entrance. This is because one colloid body may pass through another: from the alimentary tract, for instance, into the walls of the intestine and through this into one of the circulatory systems, and again out of these through the substance of the kidney into the urine.

In this way an infectious agent may wander through any of the tissues of the body, provided the proper surface tension relationships are present, without leaving behind any mark indicative of its passage. Through discussion of the opsonins special interest has recently been attached to the methods by which the surface tension relationships of bacteria to fixed or motile cells may be altered under physiologic and pathologic conditions. An opsonin is nothing but a substance to which has been given an evanescent name, which is capable of so altering the relationship of surface tension of bacterium to cell as to allow the former to be taken up. Many conditions are capable of markedly changing surface tension relationships, and there can be no doubt that we shall on some day not far distant become acquainted with innumerable simple chemical bodies which will, when added to mixtures of leucocytes and bacteria act as our now mysterious "opsonins." We must, however, carefully distinguish between the mere inclusion of an infectious agent and its destruction. Many workers on the opsonins take the swallowing of a bacterium by a cell and its destruction to be synonymous. This is a grave mistake and can not be too vigorously guarded against. Inclusion and destruction are two separate processes, and their mechanism must be separately considered.

DISCUSSION.

DR. A. J. CARLSON, Chicago: I am not familiar with the pathologic side of edema as such. Of course, when one ligates a frog's leg, as Dr. Fischer has done, one produces very abnormal conditions. As far as I know, in the case of local edema at least, there is no evidence of the formation of this specific substance. I think, however, that there is something in this suggestion, but it is only one of the factors in the tissue cell. I do not know that we can throw away the conception of such terms as secretion, inasmuch as terms like that stand for a mass of material the nature of which we do not understand. Nobody, of course, pretends to say that such terms are positive. I think that perhaps two more factors must be considered in edema, namely, the lymphatics and also the blood vessels.

DR. A. D. HIRSCHFELDER, Baltimore: The conditions of edema in which the limb is ligated and both circulation and lymph flow are cut off are to be differentiated sharply from those in which there is some residual circulation. In the former case, as shown by Loeb ten years ago, differences of osmotic pressure are possible, and probably actually occur. I am under the impression that Loeb did demonstrate some difference between the osmotic pressure of the tissues of the frog's legs above the ligatures as compared with the parts below them. In the latter case the circulation is always rapid enough to allow osmotic interchanges to go on, and marked differences in osmotic pressure do not take place. I therefore think that this is the difference between the two forms of experimental dropsy. The injection of formic acid and other substances certainly brings about injury of the endothelial walls of the capillaries quite as much as it does the very interesting phenomenon of absorption by colloids.

DR. W. H. WELCH, Baltimore: Are the phenomena Dr. Fischer finds applicable to all forms of edema? It can hardly be that a single explanation can apply to all varieties of edema, the mechanical as well as the cachectic. We shall probably not have a clear understanding of edema, of the events, for example, which intervene between the occurrence of passive hyperemia and the accumulation of fluid in the tissues, before the physiologists have settled many disputed matters connected with the production and absorption of lymph. There are certain striking peculiarities of pulmonary edema which must be taken into account on any hypothesis framed to explain this variety. As is well known, general pulmonary edema can appear very suddenly and can disappear with equal rapidity. Can the factors which Dr. Fischer believes to be operative explain these features of pulmonary edema?

DR. H. G. WELLS, Chicago: One thing which Professor Welch just said has always troubled me in applying most of the questions in relation to edema forms; that is the formation of pulmonary edema, particularly the alveolar form in which edema occurs where there are practically no cells and where there is nothing to cause fluid to run. Why should there be an accumulation of fluid in the alveolar space where there are no cells to attract the fluids? To provoke the alveolar fluid? But there is too little of it to account for the rapid production of edema.

DR. W. B. CANNON, Boston: Dr. Fischer stated that gelatin was capable of taking up fifteen to twenty times its weight of water. As I understand it, that is the dry weight. I should like to know whether the initial amount of water normally associated with the colloids would still allow enough more to be taken to account for the results we see.

DR. MARTIN H. FISCHER, Livermore, Cal.: It seems to me that when marked edema can be produced, as it is certainly produced in these frogs, it is going out of the way to hunt trouble to insist that the lymphatic circulation must play a rôle. The burden of proof rests on this side of the argument. I am much more inclined to believe that the lymphatic circulation is the consequence of tissue activity than that it causes tissue activity. There is no circulation in these ligated frog's legs and the edema has to be explained without a circulation.

So far as the physiologic functions of the endothelium are concerned we may, of course, if we wish, use the word "secretion," but the word is not an explanation. I believe that we are going to find the explanation of the secretion of fluid into the alveoli of the lungs and into tissue spaces generally in changes in the colloids of the surrounding tissues. These after having become edematous seem to suffer a secondary change, an autolysis perhaps, through which their affinity for water is decreased, and they drop a part of their water, as it were "secrete" it into the alveoli or tissue spaces. I do not care to discuss this point further because I am experimenting on it.

To illustrate my remarks to-day, I spoke only of such colloids as can absorb water and maintain their shape. This was done to prove that colloids have an intense affinity for water independently of any osmotic conceptions. As a matter of fact the lymph and different body fluids often have enormous amounts of colloids suspended in them, and these particles in such pseudosolution also have an immense affinity for water, which I have not at all considered in my paper.

I consider it quite immaterial whether an edema is produced slowly or rapidly—whether the circulation is shut off in a moment by tying a string around the leg, or the leg is deprived of oxygen more slowly, the condition affecting only the rate of development of the edema and having nothing to do with its essential cause.

The question whether the ideas advanced are applicable to all forms of edema is one that must be tested and answered by the future. My answer now is "yes." There are a large number of edemas. The simplest forms develop in consequence of heart lesions, thrombosis, and things of that sort. When edemas similar in nature to these are produced in frogs the acid formed is so high that it shows itself readily when litmus paper is touched to the muscles. The edemas of nephritis, for instance, I explain by saying that poisonous substances are produced or retained in this condition which act on the tissues of the body and so alter their metabolism that substances capable of increasing the affinity of the colloids for water, such as acids, are produced. These acids would

then influence the colloids of the tissues. Various irritant oils when painted on the skin will produce an inflammatory edema, but these oils when applied directly to such colloids as gelatin or egg albumin, do not increase the affinity of these substances for water. We know, however, that there are a number of poisons which produce changes in the tissue that are entirely analogous to those produced through direct lack of oxygen. Potassium cyanid when present in a tissue produces all the changes characteristic of lack of oxygen—the production of acids and the swelling and bursting of the cells affected. But the details of how edema is produced by such indirect means has to be worked out.

All my remarks had to be more or less dogmatic. I do not believe that my ideas must necessarily account for everything in the pathology of edema. Just now it looks to me as though changes in the colloids would explain 97 per cent. of it. Osmotic ideas seem to account for less than 3 per cent. Some day probably with new conceptions in physical chemistry, my own 97 per cent. will be reduced to 40, 30 or 20 per cent.

A question raised was that of the rate of development of edema. I consider it one of the best arguments in favor of the views advanced that colloids are capable of changing their affinity for water in the short periods of time sometimes allowed tissues to develop an edema. In five minutes fibrin will readily take up or give off an immense amount of water. Were I to add a little calcium chlorid to a tube filled with swollen fibrin, it would make the fibrin shrink to the bottom in a few minutes, the change is so rapid. The reverse experiment can also be made. This very rapidity I consider one of the best arguments against the osmotic conception of edema. As a matter of fact, the most rapidly developing edemas observed clinically take more than minutes. One of the substances which is most markedly capable of influencing the affinity of fibrin for water is calcium. Calcium is about the only drug that ever does any good in many of the so-called urticarial diseases. Since urticarial eruptions are essentially local edemas, is it not probable that through administering calcium salts by mouth, we increase the calcium content of the tissues and thereby lessen the tendency of the tissues toward a development of these local edemas?

THE CARE OF PATIENTS AFTER ABDOMINAL SECTION;

WITH ESPECIAL REFERENCE TO THE PERIOD OF TIME THEY SHOULD BE KEPT RECUMBENT.*

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Having heard so much in discussion and having read so much in medical journals about allowing patients to get out of bed after abdominal operations in from five to ten days, it has occurred to me to ask why it is needful to do these things; what are the results from doing these things; and, wherein is the new idea an improvement on the old.

I am just old-fashioned enough to believe that it is harmful, in a vast majority of the cases generally subjected to severe abdominal operations, to get patients up in the short periods of time which are being advocated by so many at present; and I still adhere to my plan of keeping most patients recumbent for two or three weeks. With the exception of appendectomies, not acute, I would say that no patient having an abdominal section should sit up before sixteen or eighteen days, and for the following several reasons:

1. From two to three weeks are required to secure more perfect and more solid union of the incision, thus preventing postoperative hernia. Early in my operative experience I used only the through and through silkworm gut suture, then in vogue, in closing abdominal wounds. These sutures were removed in from seven to ten days, and the patients generally sat up in two weeks. Either I or someone else had the felicity of closing postoperative ventral hernias for about one in every three of the patients who were thus treated, and I assure you I had no small proportion of them on my hands, with all their discontentments, complaints and scoldings. No doubt all of you, as I have myself, have been obliged at various times to re-open an abdomen in a week or ten days after the first operation, and often the catgut or other suture material is cut, the incision may be opened down to the peritoneum by the fingers or handle of a scalpel with the greatest ease; although the parts are adherent, the line of union is so tender that separation by pressure is easily done. In another week or ten days you will find the effort to separate the line a very different proposition; the line of union is strong and resists separation.

During the past twelve to fourteen years I have used the tier suture and kept my patients recumbent for eighteen days, and I have not seen a postoperative hernia in 1 per cent. of my cases. I admit that buried animal sutures play a part in the success, but I believe that the same care in suturing and allowing patients to be about in a week will be followed by frequent hernias.

2. The majority of subjects of abdominal section are reduced physically and need rest, in order to build up bodily vigor. Especially if nervous exhaustion is present the principles of the rest treatment should be carried out and the patient placed in a better condition to proceed to normal recovery.

We are liable, in surgical work, to lose sight of the patient and his general bodily condition and center our attention on the surgical lesion for which we operate. Does the removal of the surgical lesion which has made a patient ill, or which has invalided him, restore his health? No; no more than putting out a fire restores the building which it has demolished. It is simply the removal of a cause of invalidism, but it does not at once tend to set in motion the normal performance of all the functions of assimilation and upbuilding of blood, muscle and nerve which the patient needs to be well.

A sick person undergoes operation for the purpose of getting well, not to be sent home in a week or ten days and remain sick. I know personally of many such who are still sick and ailing, simply because their body was never given the chance to build up. Patients expect to be well as soon as the operation is finished. They always expect that. The surgeon allows them to return to their homes and their usual round of duties—the result being that they use their strength as fast or faster than they can make it, and remain semi-invalids. I am speaking now of patients who are really sick and debilitated when operated on. A person in full vigor, with an operation for strangulated hernia, or some similar acute condition is a different proposition. Such patients will, if they avoid the danger of hernia, recuperate in spite of getting about so soon.

The shock to the digestive apparatus, in the debilitated is often severe and requires from a week to ten days before the normal functions of these organs are reestablished. In the meantime decrease in quantity of ingested food and consequent lack of nourishment has

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still further debilitated the patient. I can not see how it is possible to advise a person in such physical condition to try to be about. We might as well, for instance, advise a bankrupt, where everything is on the minus side of the ledger, to go into the market and take advantage of great bargains in the prices of stocks and bonds. He must be built up, accumulate some working capital, before venturing into investments.

This is an age of specialism. Unfortunately, the class of specialists who are growing up to-day are specialists from the college to the grave; not as they were among the earlier and older men in the special departments, first general practitioners and then specialists. The older and earlier specialists saw beyond the focus of their specialist lenses. I fear the horizon of the coming specialists is becoming narrowed. There are coming into active prominence many young men who have known from practical experience very little of the interrelations of local and general conditions. I feel that it is a mistake to allow this doctrine of looking at the local conditions and ignoring the general conditions of the patient to gain ground with these rising young specialists; for their view is going to be narrow enough without any such teachings.

By keeping debilitated patients in bed after operation, feeding them well as soon as they can digest and assimilate food, assisting assimilation by favoring elimination of waste products by keeping the skin, bowels and kidneys active, together with massage to help on the lymphatic and venous return circulation, thus building up muscular tissue, are we doing our best to restore the patient to a condition whereby he can continue to improve after he is able to arise from enforced rest?

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DISCUSSION.

DR. H. J. BOLDT, New York: I do not think any one who practices surgery would for a moment consider treating his patients in one manner without exception. We have all gone over this field so frequently that I do not think it would be necessary for any one to emphasize again that patients must be treated individually, and that the general system must be considered in the after-treatment. Has Dr. Frederick ever tried the early mobility of abdominal section patients to such an extent as to permit him to form an opinion as to the result of this form of treatment? I believe that Dr. Ries deserves credit for first calling attention to the early mobility of patients a number of years ago. I was doubtful of the results, as were many others, until I had tried the plan and accumulated a large experience from personal observation. I repeat what I said three or four years ago, that if one will observe his patients, there is no other treatment that will compare for the rapid convalescence of the patients, with early mobility, provided that everything is favorable for such treatment.

So far as subsequent hernias are concerned, I do not wonder that one-half of the patients by the old method of suturing did subsequently have hernia. If, however, we use the present method of suturing and subsequently place a properly adjusted abdominal support on the patient, there is no reason why any such patient should get hernia. I have reexamined several hundred patients and have failed to see a single instance of hernia from a clean case. This is true not only from my own observation, but from that of some of my pupils and assistants who have carried out that line of treatment.

I maintain that if patients feel inclined to get up within twenty-four hours, they may do it with perfect safety. It is not necessary that they get up, but if they feel so inclined and do it, convalescence is more rapid. They should eat whatever they want unless it is especially contraindicated. Attention should be paid to the general health of the patient, and then, following out this line of treatment, I am confident that a more rapid convalescence and early resumption of household duties will be accomplished.

PROF. AUGUST MARTIN: My own experience is in favor of allowing patients to move as soon as they like after laparotomy. Usually they do not like to get up the first day, but on the second day they like the fun of moving, and if they wish to get out of bed the third or fourth day, I do not object. I do not hurry them, and if any one wishes to stay somewhat longer in bed, I do not object, but I make them sit up on the third or fourth day. My own experience in this question is a somewhat long one. I recall one of my earliest cases of splenectomy. When I came to look after the patient on the fourth day, I did not find her in her bed and was told that she had gone out. I found her sitting out of doors and enjoying it very much, and there was no trouble whatever.

We must differentiate these cases and if there is any other trouble, from the lungs or the heart, or any other condition, we should be cautious and look after the patients with some care, not allowing them to go out if there is any symptom of any kind of disorder. The question as far as abdominal operations is concerned, I think is settled by sufficient experience so that we may recommend this treatment. The question is not, however, settled regarding the lying-in cases. We do not keep patients in our puerperal cases in bed as long as we did before. We have undergone another change in respect to puerperal cases; we do not force patients to starve. We nourish them from the very beginning. This is another point that must also be kept in mind for cases of abdominal operation; we do not withhold food as long as we did before. In puerperal cases the conditions are different in that there is an organ in which we find a large wound which must heal, which is not fixed as we can fix the abdominal organs.

When the puerperal uterus is moving and sinking, I think that the danger of any disorder may be more imminent. In spite of that, it seems to me that the permission to get out of bed early is dependent only on the necessity of the case. If puerperal women are forced to go to work early, then I think it is better to keep them in bed for a longer time. But if they can be cared for quite comfortably, they might be allowed to go out of bed as soon as they like. In the question of thrombosis or other disorders, my experience is that these conditions are less frequent if the patient is not kept in bed a long time. We have made progress by following the advice to allow patients to get out of bed rather early after laparotomy.

DR. C. C. FREDERICK, Buffalo: I think that many young men beginning operative work are liable to be led away from the principles of taking into consideration the individual and not the operation. A great many of these young men are turning out patients who should not be turned out early and not discriminating between the different cases. I do not keep every patient in bed. I spoke of a certain class, of neurasthenic women particularly, who do better if they are kept in bed for ten days or two weeks with rest treatment. I still maintain that there is a class of debilitated women that do better under the rest treatment. I know the value of this method, because I have tried it in my own family. If those patients are made to get up early, within a week or ten days, they do not do so well. If, however, they are carried along under the rest treatment, they get up in better condition.

Prevention of Typhoid.—F. S. Hammond, Trenton, N. J. (*Jour. Med. Soc. New Jersey*), states that in so far as the specific cause of the disease is definitely known and its means of dissemination understood, typhoid fever is a preventable disease, the only rational prophylaxis being not only the safeguarding of common food and water supplies, but the early recognition and isolation of infective individuals and the immediate destruction of the specific organism as it leaves the body.

ANAPHYLAXIS INDUCED BY BACTERIAL PROTEINS.*

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The discovery of the production of hypersensibility, in animals to horse serum, egg white, etc., suggested the possibility of a similar hypersensitization to other proteid materials. It was thought possible that the protoplasm of bacterial cells might lead to similar effects, and in consequence there might be danger from the employment of bacterial vaccines where for some reason the interval between a first and second dose was sufficient for the hypersensibility to develop.

In order to determine whether the foregoing conceptions were correct, a series of experiments was outlined in which guinea pigs received a small dose of a living bacterial culture which was followed, after an interval of fourteen or more days, by a second injection of the same organism.

I selected for the organisms to be employed in these experiments some of the common saprophytic bacteria so as to exclude the possibility of infection. The organisms employed were: *Bacillus cereus, B. megatherium, B. subtilis* and *B. mesentericus.* These organisms were selected because they are generally regarded as being non-pathogenic and they grow readily on the ordinary culture media, so that it is easy to secure a considerable mass of bacterial cells for injections.

The injections were always made into the peritoneal cavity, and the size of the sensitizing doses was either 0.2 c.c. or 0.5 c.c. of a bouillon culture. The second injection ranged from 5-10 c.c. and was always administered intraperitoneally.

There were fourteen experiments with *B. cereus,* of which nine resulted in the production of what was considered as a typical reaction, and two of the results were regarded as atypical. Three of the animals died as the result of the first injection or of some intercurrent cause.

There were six experiments with *B. megatherium* in one of which there was an atypical reaction, and in one case there was induced a purulent peritonitis which terminated fatally three days after the second injection. The other four animals had rather mild symptoms (hypersensitization) from which they recovered.

There were three experiments with *B. subtilis* in one of which there was an atypical result, while the other two had severe symptoms, but subsequently recovered.

There were three experiments with *B. mesentericus* in one of which there was a typical result, while in the other two severe symptoms were developed, but the animals recovered in twenty-four hours.

There were also three experiments in which the guinea pigs had been sensitized with *B. megatherium, B. subtilis* and *B. mesentericus* respectively, and received a second injection of *B. cereus.* Though each of these animals died, as well as two normal animals injected with the same culture to serve as controls, it is evident from the symptoms and lesions that these results were due to the toxic effects of the organisms. In none of these five instances was a typical effect produced, and death resulted in from three to five hours after the injection.

Contrary to my expectations at least some of the cultures which I employed in my experiments were found to be capable of producing fatal effects, especially *B. cereus,* and hence it is impossible to be certain as to the outcome of the experiments. It seems, however, that, as a rule, the fatal termination occurs far more rapidly in the sensitized animal than in the normal control animal, and there is also a more marked pathologic reaction in the sensitized than in the normal animal.

The results which have been regarded as typical were as follows: In a few minutes after the injection of the second dose, the animal manifests movements which indicate irritation of the peritoneal cavity, followed at times by scratching of the head and face, followed later by profound prostration, twitchings, convulsions, stupor, and death in one-half to two or three hours.

At autopsy there was at times marked subcutaneous edema, and the peritoneum, stomach and intestinal walls showed marked hyperemia, with local hemorrhages into the submucous coat of the stomach and intestines, and at times into the kidney and spleen. The peculiar nervous symptoms which these animals manifest indicate that the central nervous system is involved, and on removing the cranium the meninges are seen to be markedly hyperemic, though no hemorrhages were noticed.

The theories that have been advanced to explain the nature and cause of the hypersensitization of animals to various proteid materials are quite variable, and none appear altogether satisfying. Courmont believes that the first injection leads to the absorption of a natural protective substance and leaves the animal defenseless against a second injection. Bail believes that death is due to the production of a substance which impedes the activity of the leucocytes. Richet suggested that the phenomena are due to the presence in the proteid material of the two bodies, the one causing immunity and the other hypersensibility. Wolff believes that there is no immunity to foreign albumins of the endotoxin class, and that through the solution of the cell walls of the bacteria as the result of protective substances formed because of the first injection, the endotoxins are liberated suddenly and in large quantities. Besredka and Steinhardt believe that the first injection produces a brain lesion which renders the organ especially susceptible to the second injection. Currie believes that the antibody formed because of the first injection unites with the antibody-forming substances of the second injection; their union is rapid and the whole charge of the poisonous substance is freed, giving rise to sudden and severe effects.

Rosenau and Anderson state that it is probable that the first injection induces a reaction resulting in the production of antibodies, so that when the second injection is made there is probably either a union or a reaction between the antibodies and the substances in the material injected subsequently which produces the poisonous effect. Vaughan believes that proteid susceptibility and immunity are different manifestations of one and the same process. Both depend on the development in the animal body of a specific proteolytic ferment which acts on the proteid that brought it into existence. This specific proteolytic ferment stored up in the cells of the animal as a result of the first injection remains in the cells as a zymogen until activated by the second injection of the same proteid. Rosenau and Anderson[1]

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. Bulletin 36, Hygienic Laboratory, U. S. P. H. and M. H. S.

state that "profound chemical changes, perhaps in the central nervous system, are probably produced by the first injection of a strange proteid." Otto believes he has discovered a specific antibody in the blood serum of the sensitized animal. Gay and Southard attribute the hypersensibility to a "rest" remaining in the blood of the animal from the first injection which they designate "anaphylactin." Lewis states that the hypersensitive reaction depends on the development of a special antibody during the incubation period, which antibody may be transferred to a second animal in the blood serum.

My experiments have been too limited in number and too indefinite in results to permit very positive statements as to the nature and cause of the hypersensibility. However, the definite period of incubation which is necessary for the development of the hypersensibility indicates that some form of antibody is developed as a result of the first injection which takes part in the production of the symptoms and lesions after the second injection. It seems evident that either a poisonous compound is liberated from the proteid of the second injection through the influence of the newly formed antibody or else there is formed such poisonous substance through the union of the newly formed antibody and a portion of the proteid material of the second injection.

Although I have not studied the histologic changes produced in the abdominal organs and in the central nervous system, it seems probable that the poisonous substance formed as the result of the second injection has a direct action on the central nervous system and on the sympathetic nervous system as indicated by the profound influence on the respiratory center of the brain and the pathologic effects as shown by the focal hemorrhages into the internal organs. Histologic study of these organs may throw additional light on this point.

Several attempts were made to prevent the development of the effects from the second injection by two methods; the first consisting of the etherization of the animal before administering the second dose, and the second in the employment of small doses at short intervals instead of one large dose for the second injection. Neither of these methods yielded very encouraging results, but this was probably due, in large part, to the fact that the cultures employed were possessed of some toxic properties.

No attempts were made to inhibit the effects of the second injection through the use of the serum of an animal rendered immune to the particular organism employed. It was found possible to neutralize the effects of a second dose of horse serum by the use of the serum of an animal immune to horse serum. I am unable to say whether the same results would follow with cultures.

The results of the investigation showed that there might be some danger in the use of second injections of bacterial vaccines when the first injection precedes the second by an interval sufficiently long for the development of the sensitizing effects. It is evident, however, that the danger under these conditions would be very remote because the dosage of bacterial vaccines employed ordinarily is too small to be dangerous.

3965 Brown Street.

DISCUSSION.

DR. VICTOR C. VAUGHAN, Ann Arbor: I object to the term anaphylaxis. Anaphylaxis means decreased protection, and it seems to me this is overprotection rather than decreased protection, because, as all the work done along this line shows, the second dose must be, as compared with the first, quite an appreciable quantity.

DR. D. H. BERGEY, Philadelphia: The cultures I employed were presumably non-pathogenic, but if I were to do the work over again I would use cultures that were killed by some means so as not to produce infection, that I might use the full organism and not the proteid from the organism. That is an important criticism of my work, and I should be guided by it in continuing it.

THE ALLEGED URINARY MANIFESTATIONS IN DISEASES OF THE PANCREAS.*

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CINCINNATI.

It has long been an accepted fact that through experimental operations on the pancreas conditions may be produced that lead to certain changes in the urine. On the other hand, until 1904, when the work of Cammidge first appeared, there was not known in clinical medicine any alteration in the constituents of the urine, which was regarded as characteristic of, or as indicating, disease of the pancreas.

At that time Cammidge, of London, described in the Arris and Gale Lecture[1] his studies on the urine of patients suffering from pancreatic disease, and the reaction he then described has since become known as the "pancreatic reaction of Cammidge." As the direct result of criticism of his technic and conclusions, that author modified his procedure until he finally published his "improved" or "C" reaction, which is supposedly free from error.

THE WORK OF CAMMIDGE.

Briefly stated, the present contention of Cammidge is, that there occurs in the urine of patients having an inflammatory disease of the pancreas, a substance, which, on being boiled with strong hydrochloric acid, will split off, or yield, a body that forms an insoluble compound with phenylhydrazin, after the method of preparing ozazones. With the exception of one case which he studied, Cammidge, in all his writings on the subject, has never attempted to define the nature of the body in question, or of the mother-substance. In the case referred to he determined the body to be pentose. On wholly insufficient evidence, or on no scientific evidence at all, Cammidge declares the crystals to be of a different substance in different diseases, and that their peculiar behavior to certain reagents may, within a minute or two, determine the particular disease from which the patient is suffering.

In an examination of 87 cases of disease of the pancreas, Cammidge found a positive reaction in 71, or in 82 per cent., and a negative reaction in 12. These 12 cases were out of 16 cases of cancer of the pancreas, all cases of acute and chronic pancreatitis having been positive. Of 117 cases of various conditions supposedly non-pancreatic 113 were negative in reaction and 4 positive. Of 50 specimens of normal urine all were negative. Cammidge, therefore, states[2] "The result of the improved or C reaction is an absolute one and is,

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. Lancet, March 19, 1904; also the complete history of the test and its application, Robson and Cammidge: The Pancreas, Its Surgery and Pathology, 1907.

2. Robson and Cammidge: The Pancreas, Its Surgery and Pathology, p. 250.

therefore, independent of the personal bias of the investigator." And, again, "We maintain that a positive reaction is strongly suggestive of inflammatory disease of the pancreas, but we are not prepared to contend that it is pathognomonic of disease of the pancreas." Cammidge further states that the reaction disappears when the cause of the inflammation disappears.

CRITICISM OF CAMMIDGE'S WORK.

Whatever else is recorded in medical literature on this subject is relative to the work of Cammidge. It was unfortunate that the earlier reports by that author were lacking in that spirit of directness which is found in his later work. Until Cammidge finally determined that the body, which he described in his improved or C reaction, was the substance to be looked for, he worked in the earlier, so-called A and B reactions, with glycuronic acid compounds admixed with the latter. The unscientific and ambiguous claims which he set forth, and his faulty technic called forth a spirit of antagonism in the critical mind. Those who repeated the early experiments of Cammidge unhesitatingly declared them to be wrong in principle and faulty in method,[3] and the subject was then ignored. The few clinical references as to the applicability of any other than the improved or C reaction are, therefore, without value.

With the appearance of this improved or C reaction a working basis was offered for further study. From a scientific standpoint by far the most important work was done by Felix Eichler[4] in the department of experimental biology of the University of Berlin. Eichler produced experimentally in two dogs a pancreatitis purulenta diffusa, and in one dog a pancreatitis hemorrhagica. Before the operation the urine of each dog was found to give a negative reaction. After the operation the urine in each case was found to give a positive reaction. Moreover, he determined the melting point of the crystals to be 182 C, which is not that of an ozazone of glucose, nor that of the compound of glycuronic acid. Beyond that he did not define the substance. It should be noted that Cammidge did not carry out this simple experiment, which should have been the fundamental study in the work, the importance of which he, above all others, conceived.

Eloesser[5] reported from the University Clinic at Heidelberg sixteen cases in which a positive pancreatic reaction was found in the urine, and in which the diagnosis was confirmed by operation. In one case the reaction was positive and there was no pancreatic involvement.

Edgecombe,[6] of London, reports a case of mumps in which the pancreatic reaction was positive. Cammidge himself made the test.

An interesting report is furthermore contained in the article of Watson.[7] Watson obtained a markedly positive reaction in all cases of chronic and acute pancreatitis, the diagnosis having been confirmed by operation, or postmortem; also in the course of other diseases, which were diagnosed as chronic pancreatitis because of the recurrence of suggestive clinical symptoms, such as epigastric pain and jaundice. A marked reaction was also found in a case of constipation, which improved by proper treatment, and he suggests that pressure of fecal masses on the pancreas may interfere with its function. In this case, and in several others, an alimentary glycosuria was noticed. Watson found, furthermore, a moderate or slight reaction in various other diseases, as of the heart, kidneys, liver, gall bladder, in colitis, gout, arteriosclerosis, alcoholism, and in two cases of exophthalmic goiter, one of which was benefited by the administration of pancreas emulsion, and in one the histologic examination showed round-celled infiltration of the pancreas. Positive reactions were also obtained in gastric ulcer and in malignant disease of the stomach. In many of these apparently non-pancreatic diseases an involvement of the pancreas, at least functional, can not be excluded.

Further contribution to our knowledge of urinary manifestations of pancreatic disease must be made from studies along definite lines. The experimental work of Eichler must be repeated. When the clinical diagnosis of pancreatitis is made it must be verified by operation during life or by necropsy. Lastly, clinical observations must be made in cases in which there are no pancreatic manifestations. The difficulties which are encountered in the effort to produce results that are entirely free from objection, considering the complexity of the material, need not be especially emphasized.

ORIGINAL INVESTIGATIONS.

The following observations, which I present as a small contribution to the subject, were made primarily with the object of investigating the occurrence of the pancreatic reaction in the urine in various conditions. During the past six months I have examined the urine from 85 individual cases. In all, 110 chemical analyses were made. Of the 85 patients 50 have been under my personal care, having come under observation for various stomach and digestive disorders. Ten specimens were examined through the courtesy of other physicians, and twenty-five specimens were from patients in hospital wards, having no specific evidence of pancreatic disorders.

RESULTS OF THE ANALYSES OF URINE FOR THE PANCREATIC REACTION.

Clinical Diagnosis.	Cases.	Positive.	Negative.
Chronic pancreatitis	4	3	1
Cancer of pancreas	1	1	
Cancer of stomach	3	2	1
Abscess of pancreas	1		1
Gallstones	4	1	3
Catarrhal jaundice	4	1	3
Tuberculosis of peritoneum	1	1	
Tumor of upper abdomen, probably of pancreas	2	2	
Cancer of liver	1		1
Cholecystitis	3		3
Tuberculosis pulmonalis	2		2
	26	11	15

The remaining 59 cases included arteriosclerosis, myocarditis, angina pectoris, nephritis (uremia), cirrhosis of the liver, constipation, ulcer of the stomach (blood), achylia gastrica and nervous disturbances of the gastrointestinal tract. In all these cases the reaction was negative. Twenty-five of these were miscellaneous hospital ward cases. Thus in the urine of sixty patients complaining of digestive disorders or having diseases of the digestive organs, the reaction was positive eleven times. In three of these eleven cases the clinical diagnosis of pancreatitis had been made. A few details of these cases may be of interest.

Cancer of the Pancreas.—The patient was under the observation of Dr. Forchheimer, who made the clinical diagnosis.

3. Ham and Cleland: Lancet, May 14, et seq., 1904; Schroeder: Amer. Med., September, 1904; Willcox: Lancet, July, 1904; Haldane: Edinburgh Med. Jour., November, 1905.
4. Berl. klin. Wchnschr., xliv, 1907.
5. Mitt. a. d. Grenzgeb. d. Med. u. Chir., xviii, 42, 169.
6. Practitioner, February, 1908.
7. Brit Med. Jour., April 11, 1908.

The patient died shortly after that; no necropsy. The urine gave a more pronounced reaction than any other I have observed. I obtained enough of the crystals to determine the melting point, which was 180 C. So far as I know, this is the only clinical record of a melting point determined of this substance. In view of the fact that Eichler in his experiments on dogs found a body having a melting point of 182 C., it is likely that I obtained the identical substance.

Chronic Pancreatitis.—One patient was under the observation of Dr. Bettmann, suffering with violent, colicky abdominal pains, epigastric tenderness and recurring chills and fever. The reaction was well marked and subsided gradually with the patient's symptoms (six analyses). A specimen was immediately re-examined on the recurrence of fever in the course of recovery. The reaction was negative and the cause of the fever was found to be tonsillitis. In a second case, where the clinical diagnosis had been made by Dr. Forchheimer, the urine was examined after the patient had practically recovered. The reaction was negative. The two remaining patients were under my own observation, complaining of "intestinal indigestion"; the feces showed excess of fat and muscle fibers. (Reaction positive.)

Cancer of the Stomach.—In two cases a positive reaction was obtained. One case under my own observation developed an alimentary glycosuria. The diagnosis was confirmed by operation. There were dense adhesions so that the degree of involvement of the pancreas could not be determined. One case was under the observation of Dr. Bettmann. The operation also confirmed the diagnosis and found the pancreas involved. In a third case, which I was asked to see in consultation with Dr. Schulze, I made the clinical diagnosis of cancerous ulcer of the stomach. The pancreatic reaction was negative. The patient died within ten days, and I had the opportunity of making a postmortem examination. The clinical diagnosis was confirmed; the pancreas was found adherent, but the gland itself was not involved. There were no gallstones.

Abscess of the Pancreas.—Under observation of and operation done by Dr. Whitacre. A specimen of urine three days after operation gave negative reaction.

Gallstones.—Of four cases operated on, one case, having a stone in the common duct, gave a positive reaction (case of Dr. Bettmann and Dr. Ransohoff); one case, with a stone in the common duct, gave a negative reaction; one case, having much post-operative pain, gradually subsiding, gave a negative reaction (case of Dr. Ransohoff); one case, gall bladder packed with stones, gave a negative reaction. The pancreas at the operation was found to be hard and nodular.

Catarrhal Jaundice.—Of four cases examined, one was positive and three were negative.

Tumor of the Upper Abdomen.—One case was from Dr. Holt's service at the Cincinnati Hospital. The tumor was regarded as possibly of pancreatic origin. The reaction was positive. No operation. The second case was under observation of Dr. Bettmann. Clinical features the same. The reaction was positive. The feces contained fat and muscle fiber.

Tuberculosis of the Peritoneum.—This case was under my observation for three weeks. The reaction was positive during a period marked by attacks of sharp pain (four examinations). Two months later the examination gave a negative result.

TECHNIC.

In these examinations the method as described by Cammidge has been strictly followed. His procedure consists in boiling the urine with strong hydrochloric acid, neutralizing the excess of acid with lead carbonate, removing the glycuronic acid and other interfering substances with tribasic lead acetate, and the excess of lead in solution with sodium sulphate, and the forming of the ozazone in the usual manner. This method does not permit of modification, except in one particular, which facilitates the work, namely, that one may work with smaller quantities after the initial boiling with acid.

The method that I have found convenient is as follows: 40 c.c. of the urine, filtered, acid reaction, free from albumin and sugar, are boiled with 2 c.c. of strong hydrochloric acid for ten minutes. After partly cooling, 8.0 gm. of lead carbonate are gradually added. When the reaction is complete, the mixture is chilled, filtered, and 10 c.c. of filtrate diluted to 20 c.c. with distilled water. This solution is precipitated with 2.0 gm. of tribasic lead acetate, filtered, and the excess of lead in solution removed by the addition of 2.0 gm. of sodium sulphate, bringing the mixture to a boil, chilling and filtering to 20 c.c. To this filtrate there is now added a mixture of phenylhydrazin hydrochlorate 0.80 gm., sodium acetate 2.0 gm. and of 50 per cent. glacial acetic acid 1 c.c., and the whole is boiled on a sand bath for ten minutes. The solution is then filtered while hot, and set aside to crystallize. The precipitation of crystals, sometimes only in microscopic quantities, of the characteristic formation of ozazones, makes a positive reaction.

The following precautions must be observed:

1. The urine must not contain albumin or sugar, and must be fresh and filtered clear.

2. Positive reactions must be verified by making the phenylhydrazin test for free sugar in the urine, using the same method without previous boiling. Fehling's test is not sufficiently delicate. The sufficiency of removing sugar by previous fermentation has not been proved.

3. Tribasic lead acetate ($Pb(C_2H_3O_2)_2.2PbO$) must be employed. The solution of lead subacetate of the U. S. Pharmacopeia is not satisfactory. I have employed it side by side with the tribasic lead acetate and have obtained misleading results with the former. Before realizing this difference I had some correspondence with Cammidge on the subject, and I agree with him that the tribasic lead is the only suitable precipitant, because of the uncertain and indefinite composition of the pharmacopeial preparation. The positive reaction may be marked or may require microscopic examination. I have noted precipitates that were not crystalline and, therefore, negative. Precipitation may take place immediately on filtering or may occur after standing twenty-four hours. Except as to size, the crystals that I have observed in various positive reactions were apparently of the same system. I can not concede any value whatever to such tests as solubility in sulphuric acid, as tending to point to the nature of the disease, and I have, therefore, never applied this test.

PATHOLOGY.

The apparent value of the pancreatic reaction in the urine makes it reasonable and of interest to reflect on the nature of the conditions that may give rise to this manifestation. The proven results so far obtained would suggest, first, that inflammatory conditions in the pancreas give rise to the reaction. Second, we may infer that chronic pancreatitis *per se* does not give rise to the condition, because the reaction disappears when the cause, such as gallstones in the common duct, has been removed, the infiltration of the gland, the mark of the chronic inflammation, remaining. The reaction, therefore, can not be said to be the direct result of the chronic pancreatitis, but rather of a functional disturbance coincident with the existence of causative factors. Third, it has been shown that pancreatic tissue contains a larger amount of pentose yielding material than any other tissue in the body. Therefore, disintegration, as in cancer and abscess, may lead to absorption and subsequent excretion of pentose. Fourth, pancreatic

disturbance may lead to incomplete combustion and excretion of substances of the nature of aldehydes and ketones. Fifth, in the presence of fat necrosis, glycerin products, incompletely oxidized, may give the reaction. Sixth, impaired pancreatic digestion in the intestines may lead to absorption of certain substances that give the reaction.

Cammidge himself suggests that in the absence of pancreatitis, conditions accompanied by rapid tissue changes may produce substances giving the test.

CONCLUSIONS.

The conclusions that may be drawn at this stage of the investigation are limited. They are as follows:

1. It has been proved that inflammatory and destructive disease of the pancreas may give rise to the appearance of certain, as yet undefined, bodies in the urine, belonging possibly to the sugars or related compounds.

2. The reaction is not pathognomonic for disease of the pancreas, in the clinical sense.

Extensive clinical observations on the urine in pancreatic and other diseases must finally determine the value of the pancreatic reaction.

22 West Seventh Street.

Clinical Notes

A CASE OF EXTRAUTERINE PREGNANCY.

ROBERT L. GIBBON, M.D.
CHARLOTTE, N. C.

Patient.—Mrs. Q., aged 41, married seventeen years, had never been pregnant before unless a very indefinite history of miscarriage many years ago, be admitted as such.

History.—The last regular menstrual period occurred July 11, 1907. A few weeks later there was a flow from the uterus which was not very free, but persisted for one or two weeks, stopped, and then returned for a time. She was at home in Philadelphia at this time and was examined in the latter part of October by her family physician, who pronounced her pregnant. Returning to Lincolnton, N. C., she came under the care of Dr. Wise, who took her to the Presbyterian Hospital at Charlotte during the last week in November. At this time, about four months after the last menstruation, the patient had become very uneasy about her condition and feared an abdominal tumor.

Examination.—Examination disclosed an abdominal mass corresponding in size with the supposed stage of pregnancy. Bimanually ballottement was easily obtained, but the presenting part of the fetus was not readily made out. No fetal heart sounds were heard, but uterine souffle was pronounced. The diagnosis of pregnancy was confirmed and the patient returned home.

Subsequent History.—Nothing more was heard from the patient until May, 1908, when her physician told me that the patient had gone a month or more over her time, that fetal movements had entirely ceased for six weeks, although they had been vigorous and even annoying up to that time, and that the patient's general condition was not good.

May 6: She was brought to the hospital again, and the following history was obtained covering the period since the previous November: Abdomen continued to enlarge up to six weeks ago, when severe pains, of an intermittent character, came on and the patient, supposing she was in labor, summoned her medical attendant. Matters did not progress, however, and after a time the pains ceased. Fetal movements were not noted after this pseudolabor. From the fourth to the end of the ninth month the patient suffered continuously from abdominal pain and gastric disturbances. On several occasions a membranous substance was discharged from the vagina, and on one of these occasions the membrane discharged resembled a cast of the uterine cavity.

Examination.—It was easy to make out by palpation the parts of a well-developed child. Vaginal examination disclosed the head presenting, it being felt apparently in the posterior cul-de-sac; the os was not patulous. In addition, two masses were felt through the abdominal wall which were supposed to be fibroids. Uterine souffle was absent.

Operation.—On May 9, the abdomen was opened in the median line. The omentum was found firmly adherent to two medium-sized fibroid tumors on the anterior surface of the uterus and completely prevented any view of the organs beneath. What was more surprising, however, was the condition of the omentum itself; it was almost perfectly black, as though on the point of becoming gangrenous. As a consequence, a large portion, about two-thirds, was ligated in sections and removed. The uterus was then seen to be enlarged to the size of a four-months' pregnancy, while behind and to the right was a dirty, brown colored mass, which on being opened disclosed a fully developed male child, in a somewhat macerated condition. In spite of the fact that the child had been dead at least a month, the placenta was found firmly attached and no effort was made to detach it, but instead it was found possible to remove about three-quarters of the sac, including that portion to which the placenta was fixed. The remaining portion of the sac was brought out at the lower angle of the wound, the edges clamped with forceps and the cavity packed. The abdominal incision was closed in the usual manner, except at the lower angle.

Result.—The patient ran a moderate temperature during the separation of the remainder of the sac, and developed a mild phlebitis of the right leg, but in other respects the recovery was uneventful. I am unable to explain the condition of the omentum, which may have been due to an infarction, but at time of operation its appearance gave rise to the gravest apprehension.

HYPERSUSCEPTIBILITY TO HORSE SERUM.

MAX DREYFOOS, M.D.
CINCINNATI.

As a contribution to the reports of cases of reactions following the injection of antitoxic sera, I wish to add the following report. It is, I believe, the first case reported in which this reaction has followed the injection of tetanus antitoxin.

Patient.—A young man of 24 years, on June 16, 1908, sustained a punctured wound of his left foot by stepping on a rusty nail at an iron-yard. He went to the Jewish Hospital, where he was placed on the service of Dr. Joseph Ransohoff. Under local cocain anesthesia a triangular-shaped area of skin and subcutaneous tissue about one-half inch deep, and containing the wound, was excised from the plantar surface of the foot, and the resulting wound thoroughly cleansed. Throughout the operation the patient was perfectly composed and was not distressed in any way.

Administration of Serum.—A prophylactic injection of 10 c.c. (1,500 units) of tetanus antitoxin was then given under the left breast, and a moist bichlorid dressing was applied to the wound.

Effects.—About one-half to one minute after the injection of the serum the interne bandaging the foot noticed that the patient began turning this foot from side to side, and then flexing and extending the knee. When asked why he did not keep his foot quiet, the patient replied very brokenly: "Oh—I wish—you hadn't—given—me—that—injection; the—operation didn't—hurt—me—but—that injection—makes me—feel so—sick." By that time (about two minutes after the injection) the restlessness became more marked, rapidly extending to trunk and head; the patient rolled from side to side and had to be held, to prevent his falling from the operating-table. His face was very pale, not cyanotic, and presented a very anxious expression; there was no froth at the mouth, and

his pulse was but slightly accelerated. He was very dyspneic and wanted to sit up in order to "catch his breath"; he complained of a sense of great constriction of his chest, especially on the left side, and in back, and wanted to be left on the table for a few minutes. He was, however, placed on the stretcher and wheeled to his room, and in spite of restraint struggled to assume a sitting position on the stretcher. After being in his room (five or ten minutes after the injection) he complained still more of the constriction and oppression in his chest, the pain in his back and the dyspnea, and asked to have some one press on his chest and support his back. Propping up on pillows afforded no relief; he tossed about in bed very restlessly and felt as though he were going to die. Twenty to twenty-five minutes after the injection he began to feel more easy, but was still greatly distressed and very restless. Later he was given a hypodermic injection of one-fourth grain of morphin, but this did not seem to influence the symptoms. The symptoms gradually abated, but were not entirely gone four hours later. At this time (8 p. m.) his temperature was 100.1 F., pulse 80. He was somewhat restless that night, but slept a good part of the time. The next day he felt perfectly well, apparently none the worse for his experience.

In this case there was none of the itching or puffing of the skin noted in most of the cases, also no froth pouring from the mouth, nor cyanosis.

It is perhaps fortunate for all concerned that the patient was not given a full dose of 20 or 30 c.c. of the serum, as this would in all probability have resulted much more seriously—perhaps in death.

19 West Seventh Street.

INTESTINAL OBSTRUCTION PRODUCED BY A GAUZE SPONGE.

R. C. COFFEY, M.D.
PORTLAND, ORE.

In the August *American Journal of Obstetrics* is an article by Palmer Findley on "Foreign Bodies Left in the Abdominal Cavity." He discusses various results following the leaving of sponges in the abdominal cavity and the method by which they are eventually extruded. After relating many cases he closes with an admonition to the surgeon by all means to avoid publicity to the laity concerning these things. In this connection I report the following interesting case:

On August 8, 1908, I was called to Albany, Ore., in consultation with Dr. Booth of Lebanon, Ore., and Dr. Davis of Albany, to see a case of intestinal obstruction. The patient had had a hysterectomy performed thirteen months before. There was a palpable enlargement in the right inguinal region. We all agreed that the probable condition was strangulation of a knuckle of intestine, due to postoperative adhesions. In the abdomen we found practically no adhesions in the neighborhood of the former operation, but a lump the size of a man's wrist, five or six inches long, in the lumen of the small intestine, which was entirely free. The intestine above the tumor was much distended and ecchymotic spots were numerous. The intestine below the enlargement was collapsed. An incision was made into the bowel and the lump was discovered to be cloth of some kind. Owing to the fact that it was four or five feet from the stomach and in the jejunum, and as the only adhesions in the abdominal cavity were just back of the transverse colon around the stomach, the conclusion which we all reached was that the patient was probably hysterical and had swallowed a variety of things, including this piece of cloth. A thorough search, therefore, was made of the stomach, with the idea that it possibly contained a variety of foreign bodies. Nothing was found.

As soon as the operation was completed a thorough investigation was made, and it was soon found to be a sponge which had apparently been left there thirteen months before. During this time the patient had gained twenty pounds in weight and had noticed no disturbance prior to the immediate attack, except pain in the region of the stomach and this "lump." This sponge had evidently made its way through the walls of the stomach, and thus down the intestine or through the upper part of the jejunum back of the colon. This had been well done, for while the incision was so located that we were unable to make a thorough exploration in the neighborhood of the stomach, there was scarcely anything visible aside from adhesions in front of the stomach proper and in the neighborhood of the jejunum just back of the transverse colon. These adhesions back of the colon were not strong.

Several cases have been reported in which a sponge, or other foreign body, sloughed into the large intestine, but very few, I think, in which a sponge penetrated the extreme upper part of the alimentary canal, except Ries's case referred to by Findley, in which a woman pulled a sponge from her mouth after an abdominal section. Ries was called before the state's attorney to explain and so impressed the attorney with the impossibility of the occurrence that the case was dismissed.

Notwithstanding this, the fact that our patient had had pain and a lump in the neighborhood of the stomach much of the time since the first operation, that there were no adhesions in the abdomen, except in the region of the stomach, that the cloth was beyond question a surgical sponge, makes this case authentic with scarcely a doubt that the sponge passed through the wall of the stomach and down the small intestine about four or five feet where it rolled up and produced the obstruction.

Special Article

FOURTH OF JULY INJURIES AND TETANUS.

For the sixth consecutive year we are presenting statistics regarding injuries received during the celebration of the Fourth of July, with particular reference to tetanus resulting from these injuries. Considerable effort has been made to secure reliable data, and all serious cases have been carefully investigated, so that dependence may be placed on the figures here given. We have received thousands of letters from physicians in all parts of the country, reporting cases which otherwise could not have been included in these statistics, and there are doubtless many other cases not reported, although this would refer more to the minor injuries. Our thanks are due for the many careful reports which have made these statistics more complete and the figures more reliable. The data are presented in the same manner as heretofore, in order that comparison may be made.

CASES OF TETANUS.

There were 76 tetanus cases this year, or three more than last year, but 13 less than in 1906. Since 1903, when THE JOURNAL began publishing these statistics, there has been a constant decrease until this year. It is interesting if not significant to note how the injuries from blank cartridges correspondingly decreased until the slight increase this year (see Table 5).

The most common cause of the wound is the blank cartridge, and the usual site is the hand. The duration given is the number of days between inoculation and death or recovery. Following the injury it required from 5 to 9 days before the symptoms of tetanus appear,

TABLE 1.—CASES OF TETANUS.

Name	Age.	Cause of Wound.	Site of Wound.	Duration in Days.	Result.
CONNECTICUT.					
Errico	8	Bl. c	Hand	11	D.
ILLINOIS.					
Foster	13	Bl. c	Thigh	7	D.
Fox	6	Bl. c	Finger	8	D.
Gilbert, J.	35	Bl. c	Finger	..	R.
Marlo	11	Bl. c	Hand	7	D.
Marx	..	Gunshot	Hand	..	R.
Miller	..	Bl. c	Arm	..	..
Pearson	9	Bl. c	Hand	7	D.
Roginski	..	Bl. c	Hand	..	..
Szczepanski	13	Bl. c	Hand	8	D.
Thiele	4	Firecracker	Neck	4	D.
Toma	35	Firecracker	Hand	8	D.
Wells	Boy	Firecracker	Foot	..	..
IOWA.					
Rodig	7	Cane	Leg	..	..
KANSAS.					
Gates	Adult.	Bl. c	Hand	..	..
KENTUCKY.					
Devoto	9	Bl. c	Hand	6	D.
MAINE.					
Edgar	8	Bl. c		14	D.
MASSACHUSETTS.					
Acheson	36	Bl. c	Hand	7	D.
Carroll	14	Bl. c	Hand	11	D.
Costello	12	Bl. c		7	D.
Forzley	19	Bl. c	Hand	7	D.
Stokes	12	Bl. c	Leg	16	R.
MICHIGAN.					
Gilbert	11	Bl. c	Hand	14	D.
Glogof-ky	14	Bl. c	Thigh	56	R.
MISSOURI.					
Barlow	10	Bl. c	Hand	10	D.
Brock	15	Bl. c	Hand	10	D.
Carman	13	Bl. c	Hand	11	D.
Carriger	12	Bl. c	Hand	9	D.
Tannyhill	15	Cannon	Hand	18	R.
NEBRASKA.					
Bryant	12	Bl. c	Hand	9	D.
NEW JERSEY.					
Benz	9	Bl. c	Hand	6	D.
Carroll	12	Bl. c	Finger	5	D.
Faraseidiz	8	Bl. c	Hand	8	D.
Hall	14	Bl. c	Hand	8	D.
Johnson	14	Bl. c	Leg	..	..
Kolcabage	25	Firecracker	Hand	6	D.
Paglie	8	Bl. c	Hand	5	D.
Sharpley	12	Bl. c	Hand	7	D.
Sindle	14	Bl. c	Finger	12	D.
Terasino	8	Cannon	Hand	8	D.
NEW YORK.					
Ashley	6	Firecracker	Hand	..	..
Bushman	16	Cannon	Hand	..	..
Cichowski	13	Bl. c	Hand	5	D.
Dobucki	13	Bl. c	Hand	10	D.
Fogarty	49	Firecracker	Hand	25	D.
Frie enberger	10	Bl. c	Finger	4	D.
Nolan	12	Bl. c	Hand	10	D.
Sherwood	Boy	Bl. c	Hand	5	D.
Zemrok	15	Bl. c	Hand	13	D.
OHIO.					
Vinkley	40	Fireworks		..	..
Held	19	Bl. c	Hand	8	D.
Herwch	10	Bl. c	Hand	..	..
Kaefer	Adult.	Gunshot	Thigh	13	D.
Lukaz	11	Cannon	Foot	9	D.
Olmstead	20	Bl. c	Hand	9	D.
Ricker	16	Bl. c	Hand	..	..
OKLAHOMA.					
Fine	12	Bl. c	Hand	13	D.
OREGON.					
Moores	10	Bl. c	Hand	..	..
PENNSYLVANIA.					
Connif	15	Bl. c	Finger	11	D.
Gilbert	13	Bl. c	Hand	..	R.
Marlo	..	Gunshot	Hand	..	D.
Mucka	5	Fireworks	Foot	9	D.
Roser	24	Bl. c	Hand	11	D.
Smith, M.	16	Bl. c	Finger	10	D.
Smith, T.	19	Bl. c	Finger	7	D.
SOUTH DAKOTA.					
Baker	11	Bl. c	Hand	12	D.
WASHINGTON.					
Byner	8	Bl. c	Hand	10	D.
Staab	13	Bl. c	Hand	15	D.
Stugsby	16	Bl. c	Hand	12	D.
Shorah	10	Bl. c	Hand	10	D.
WEST VIRGINIA.					
Glendenning	11	Bl. c	Thigh	14	D.
WISCONSIN.					
Hartzheim	15	Bl. c	Hand	22	R.
Hertziger	Boy.	Bl. c	Hand	22	D.
Hornke	5	Fireworks		33	R.
Koch	..	Fireworks		..	..
Winkler	10	Bl. c	Head	14	D.

the average of all cases reported being 8 days. In one case the symptoms began on the third day, while in one of the cases which finally recovered the symptoms did not appear until 16 days after the accident. Following the appearance of the symptoms death resulted in from 16 hours to 3 days, the average of all cases reported being about 36 hours. In 7 cases the entire duration of time between inoculation and death was six days or less. The average for all fatal cases reported was about 9 days. The list of tetanus cases is given in Table 1.

Tetanus cases occurred in 20 different states, or in 3 less than last year, and in 5 less than in 1906. For the fourth consecutive year Illinois reports the largest number, having 12 cases this year, 12 last year, 16 in 1906 and 20 in 1905. In 1903 and 1904 Pennsylvania reported the highest numbers. For the third consecutive year New Jersey reports the next highest number, having 10 cases this year, 8 last year and 10 in 1906. New York this year reports 9 cases or 5 more than last year. Ohio and Pennsylvania each report 7 cases this year. For the first time in the six years California had no cases, while South Dakota reports its first case this year. Table 2 gives a comparison of the number of cases in each state for the six years.

TABLE 2.—COMPARISON WITH PREVIOUS YEARS.

	1903	1904	1905	1906	1907	1908
Alabama	..	..	1	..	..	..
Arizona	..	..	..	..	1	..
California	2	4	4	3	1	..
Colorado	4	..	1	..	..	..
Connecticut	3	..	3	..	4	1
Delaware	..	..	1	1	1	..
District of Columbia	1	..	..	..	..	..
Florida	..	..	..	..	..	..
Georgia	..	..	..	..	1	..
Idaho	1	..	..	..	..	..
Illinois	19	15	20	16	12	12
Indiana	11	6	5	8	2	..
Iowa	14	2	3	4	4	1
Kansas	11	1	..	..	2	1
Kentucky	4	2	..	1	..	1
Louisiana	..	..	..	..	..	..
Maine	2	4	1	1	..	1
Maryland	1	..	1	1	..	..
Massachusetts	16	5	7	3	2	5
Michigan	20	7	10	4	4	2
Minnesota	15	2	2	2	2	..
Missouri	20	1	3	3	1	5
Montana	2	1	1	..	1	..
Nebraska	4	3	..	1	3	1
New Hampshire	2	..	..	1	..	..
New Jersey	8	9	3	10	8	10
New York	36	9	6	8	4	9
North Dakota	..	..	..	..	..	..
Ohio	6?	8	5	..	6	7
Oklahoma	1	..	1	1	..	1
Oregon	2	..	..	1	1	1
Pennsylvania	8?	17	12	5	7	7
Rhode Island	3	..	..	1	..	..
South Carolina	..	..	..	..	..	..
South Dakota	..	..	..	..	..	1
Tennessee	..	..	..	..	..	..
Texas	..	..	..	..	2	..
Utah	..	1	1	..	..	..
Vermont	3	2	..	2	2	..
Washington	2	1	..	..	2	4
West Virginia	3	..	..	2	..	1
Wisconsin	10	4	13	2	..	..
Wyoming	..	..	..	1	..	..
Total	315	165	164	89	73	76
No states having cases	30	24	23	25	23	20

Blank cartridges continue to be responsible for the great majority of tetanus cases, 58 or 76.3 per cent. of all cases this year being due to that cause, as compared with 71 per cent. last year and 60 per cent in 1906. Giant firecrackers caused only 5 cases this year, as compared with 8 cases last year and 17 in 1906. Four cases resulted from toy cannon injuries and 3 from gunshot wounds, while 6 were caused by explosions of powder or by other varieties of fireworks. Table 3 gives

a comparison of the causes of tetanus cases for the six years.

While there were 76 cases of tetanus due to Fourth of July injuries this year, only 55, or 72 per cent. of these were reported to have ended fatally, as compared with 85 per cent. of deaths last year and 84 per cent. in 1896.

TABLE 3.—CAUSES OF TETANUS CASES.

Year.	Blank Cartridge.	Giant Cracker.	Cannon.	Fire-arms.	Powder, etc.	Total.
1903	363	17	5	3	27	415
1904	74	18	5	1	7	105
1905	65	17	4	5	13	104
1906	54	17	1	7	10	89
1907	52	8	6	4	3	73
1908	38	5	4	3	6	76

DEATHS FROM FIREWORKS, ASIDE FROM TETANUS.

Besides the 55 deaths due to tetanus, there were 108 persons who were killed this year by various forms of fireworks, making a total of 163 deaths, or one less than last year, but 5 more than in 1906. While the deaths from tetanus are decreasing, the deaths from other causes are increasing, so that the total still remains high. Thirty were killed outright this year by fire-arms, 23 by giant crackers, 22 were burned to death by fire and fireworks, 19 were killed by explosions of powder, 7 by toy cannon and 7 by various causes, such as blood poisoning, by sky rockets, chemicals, etc.

As heretofore, all accidents not directly due to the discharge or handling of fireworks or other means of

TABLE 4.—CAUSES OF DEATHS NOT DUE TO TETANUS.

Year.	Gunshot.	Fire from Fireworks.	Powder, Torpedoes, etc.	Giant Crackers.	Cannon.	Other Causes.	Total.
1903	37	23	6	5	7	17	95
1904	38	18	18	2	8	8	83
1905	30	31	13	13	3	12	102
1906	30	22	19	23	7	7	108

TABLE 5.—SUMMARY BY STATES OF JULY FOURTH CASUALTIES.

	Deaths.			Injuries.					Total Persons Dead or Injured.	Causes of Tetanus Cases.		Causes of all Cases Aside from Tetanus Cases.				
	From Tetanus.	From Other Causes.	Total.	Loss of Sight.	Loss of One Eye.	Loss of Legs, Arms or Hands.	Loss of Fingers, One or More.	Other Injuries.	Total Accidental Injuries.		Blank Cartridge.	All Other Causes.	Blank Cartridge.	Fire Crackers.	Cannon.	Firearms.	Powder and Fireworks.
Alabama	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	.....	.....	.....	.....	.....	1
Arizona	.....	.....	.....	.....	.....	.....	.....	5	5	5	.....	.....	1	2	.....	.....	2
Arkansas	.....	.....	.....	.....	.....	.....	.....	5	5	5	.....	.....	.....	1	1	3	.....
California	.....	3	3	1	2	2	6	122	133	136	.....	.....	5	66	18	8	59
Colorado	.....	.....	.....	.....	.....	.....	.....	13	13	13	.....	.....	.....	4	4	2	3
Connecticut	1	1	2	.....	.....	1	4	98	103	105	1	.....	30	24	17	9	24
Delaware	.....	.....	.....	.....	1	.....	.....	11	12	12	.....	.....	.....	3	5	.....	4
District of Columbia	.....	.....	.....	.....	.....	.....	.....	21	21	21	.....	.....	.....	9	.....	5	7
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	1	1	.....	1	.....	.....	2	3	4	.....	.....	.....	.....	1	2	1
Idaho	.....	.....	.....	.....	.....	.....	.....	4	4	4	.....	.....	4	.....	.....	.....	.....
Illinois	7	13	20	1	7	7	24	499	538	558	8	4	113	183	36	44	180
Indiana	.....	2	2	.....	2	.....	.....	244	253	255	.....	.....	22	99	28	16	90
Iowa	.....	1	1	.....	3	2	3	165	173	174	.....	1	5	73	6	4	85
Kansas	.....	.....	.....	.....	4	1	4	63	72	72	1	.....	15	11	16	10	19
Kentucky	1	1	2	1	1	.....	1	28	31	33	1	.....	.....	4	3	13	12
Louisiana	.....	.....	.....	.....	.....	.....	.....	4	4	4	.....	.....	.....	.....	.....	.....	4
Maine	1	1	2	.....	.....	.....	1	13	14	16	1	.....	.....	3	4	2	6
Maryland	.....	1	1	.....	.....	.....	1	19	20	21	.....	.....	3	4	3	3	8
Massachusetts	4	11	15	2	9	2	11	391	415	430	5	.....	72	125	22	30	176
Michigan	1	3	4	.....	6	2	8	183	199	203	2	.....	20	82	11	18	70
Minnesota	.....	1	1	.....	3	.....	.....	61	64	65	.....	1	1	17	11	4	32
Mississippi	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	.....	.....	.....	1	.....
Missouri	4	3	7	.....	.....	2	7	359	368	375	4	1	165	97	12	24	72
Montana	.....	2	2	.....	2	.....	1	6	9	11	.....	.....	.....	3	2	1	5
Nebraska	1	.....	1	.....	1	.....	5	39	45	46	1	.....	3	8	11	9	14
Nevada	.....	1	1	.....	.....	.....	.....	3	3	4	.....	.....	.....	1	.....	.....	1
New Hampshire	.....	1	1	.....	1	.....	1	10	12	13	.....	.....	1	1	5	3	3
New Jersey	9	6	15	1	9	7	21	419	457	472	8	2	107	159	23	52	139
New Mexico	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York	7	13	20	2	9	12	26	578	627	647	6	3	58	212	42	76	250
North Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Dakota	.....	3	3	.....	.....	.....	3	7	10	13	.....	.....	1	6	1	1	4
Ohio	4	13	17	1	8	.....	11	506	526	543	4	3	65	217	27	80	187
Oklahoma	1	.....	1	.....	.....	1	1	6	8	9	1	.....	3	1	1	3	.....
Oregon	.....	.....	.....	.....	.....	.....	1	8	9	9	1	.....	.....	4	3	.....	1
Pennsylvania	6	15	21	1	17	13	15	920	966	987	5	2	82	311	32	68	487
Rhode Island	.....	1	1	.....	1	.....	.....	37	38	39	.....	.....	3	9	4	4	19
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	1	.....	1	.....	.....	.....	1	8	9	10	1	.....	3	1	.....	1	4
Tennessee	.....	.....	.....	.....	.....	.....	.....	5	5	5	.....	.....	.....	1	3	1	1
Texas	.....	1	1	.....	.....	.....	1	9	10	11	.....	.....	1	4	2	3	3
Utah	.....	.....	.....	.....	.....	1	1	10	12	12	.....	.....	.....	3	1	.....	8
Vermont	.....	3	3	.....	.....	2	2	14	16	19	.....	.....	.....	3	4	8	4
Virginia	.....	.....	.....	.....	.....	.....	.....	5	5	5	.....	.....	.....	.....	1	.....	4
Washington	4	3	7	.....	3	1	3	24	31	38	4	.....	4	11	10	.....	9
West Virginia	1	1	2	.....	1	.....	3	23	27	28	1	.....	6	8	4	5	5
Wisconsin	2	3	5	1	2	3	11	165	182	187	3	2	23	56	35	7	61
Wyoming	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	.....	.....	.....	.....	1
1908 totals	55	108	163	11	93	57	184	5,115	5,460	5,623	58	18	846	1,793	399	481	2,058
1907 totals	62	102	164	12	75	57	237	3,988	4,249	4,413	52	21	534	1,480	267	502	1,578
1906 totals	75	83	158	22	72	56	227	4,931	5,308	5,466	54	35	925	1,699	408	532	1,822
1905 totals	87	95	182	25	106	80	221	4,562	4,994	5,176	65	39	744	1,775	474	404	1,675
1904 totals	91	92	183	19	61	61	208	3,637	3,986	4,169	74	25	931	1,268	508	406	1,056
1903 totals	406	60	466	10	75	54	174	3,670	3,983	4,449	503	29	1,309	1,152	397	236	731
Grand totals	776	540	1,316	99	482	365	1 251	25,283	27,980	29,296	866	167	5,279	9,167	2,453	2,561	8,870

noise production on or about the Fourth of July have been omitted. Accidents which occurred in regular occupations and gunshot wounds received in brawls have likewise been omitted.

Table 4 shows a comparison of the causes of death other than from tetanus for the past four years.

In Table 5 will be found a summary of all injuries, including tetanus, and of all causes, arranged by states. Beneath the totals at the bottom of the table are given the totals for the five previous years, in order that comparisons may be made. The grand totals are also given. Table 6 is arranged to show a more ready comparison by states of the total deaths and accidents for the six years.

Pennsylvania again swings into the lead with 987 casualties, New York coming second with 647, followed by Illinois with 558, Ohio with 543, New Jersey with 472 and Massachusetts with 430. Altogether there were 5,623 accidents this year, the largest number reported in any one year. There were 1,210 more than last year and 157 more than in 1906.

TABLE 6.—TOTAL DEATHS AND ACCIDENTS BY STATES DURING SIX YEARS.

	1903	1904	1905	1906	1907	1908
Alabama	2	7	1	2	1	1
Arizona	1	...	4	5	2	5
Arkansas	...	...	3	4	...	5
California	100	138	142	96	121	136
Colorado	39	44	36	23	25	13
Connecticut	102	133	132	109	63	105
Delaware	1	5	14	8	16	12
District of Columbia	2	10	24	5	12	21
Florida	1	2	2	...	...	...
Georgia	...	...	...	4	2	4
Idaho	4	4	3	3	4	4
Illinois	306	423	542	508	468	558
Indiana	160	211	217	250	...	255
Iowa	108	137	128	255	231	174
Kansas	63	88	56	61	64	72
Kentucky	30	72	17	21	18	33
Louisiana	...	2	3	7	8	4
Maine	31	32	29	15	11	16
Maryland	21	22	13	10	25	21
Massachusetts	637	193	467	329	168	430
Michigan	144	157	208	193	163	200
Minnesota	157	102	174	95	95	65
Mississippi	...	...	...	2	2	1
Missouri	147	81	218	225	209	225
Montana	5	17	40	3	6	11
Nebraska	46	61	45	47	58	46
Nevada	...	1	2	...	1	4
New Hampshire	37	23	9	29	13	13
New Jersey	228	204	350	308	402	472
New Mexico	...	4	5	1	6	...
New York	522	540	565	681	732	647
North Carolina	...	...	1	1	...	...
North Dakota	10	8	29	11	8	13
Ohio	443	327	329	490	325	543
Oklahoma	1	3	7	14	194	9
Oregon	16	13	9	11	5	9
Pennsylvania	537	744	721	999	491	987
Rhode Island	64	30	11	21	29	29
South Carolina	...	...	...	1	...	...
South Dakota	4	10	15	5	8	10
Tennessee	4	1	5	6	4	5
Texas	2	2	4	11	7	11
Utah	23	22	25	18	30	12
Vermont	15	14	10	14	18	19
Virginia	...	11	5	8	...	5
Washington	21	25	15	25	23	38
West Virginia	19	16	34	64	37	29
Wisconsin	130	215	220	155	150	187
Wyoming	1	2	8	3	..	1

NON-FATAL INJURIES.

There were 5,460 non-fatal injuries this year, an increase of 1,211 over last year. Only 11 persons were totally blinded this year, being one less than last year and one-half as many as in 1906. There were 93, however, who lost one eye each, an increase of eighteen over last year. Fifty-seven people lost a leg, an arm or a hand this year, this being the same number as last year. One or more fingers were lost by 184 persons, a decrease of 53 below last year. The giant cracker holds the first rank as a cause of mutilating wounds and is responsible for the majority of losses of eyes, hands and fingers during this celebration of the Fourth. In the awfulness of its destructiveness, the giant cracker is equaled in a few instances only by the explosions of home-made cannon. The fact that the wounds made by the giant cracker are so lacerated and laid open is the very reason it does not cause more lockjaw. Then, also, these cases are taken to the physician, while the supposedly insignificant wounds made by blank cartridges are neglected. This year 1,793 accidents, including 23 deaths and 5 cases of lockjaw, were due to the giant cracker.

Firearms caused 481 accidents, including 30 killed and 3 cases of lockjaw. Of the total number thus injured 194 were struck by stray bullets from the reckless shooting of firearms by others. Toy cannons caused 399 injuries, including 7 killed and 4 cases of tetanus.

TABLE 7.—NUMBER REPORTED KILLED AND INJURED IN OUR LARGEST CITIES.

City.	Population Census Bureau Est. 1906.	1907.		1908.	
		Killed.	Injured.	Killed.	Injured.
New York, N. Y.	4,113,043	22	422	11	416
Chicago, Ill.	2,049,185	16	151	12	202
Philadelphia, Pa.	1,441,735	7	248	6	426
St. Louis, Mo.	649,320	3	189	4	229
Boston, Mass.	602,378	3	59	6	199
Baltimore, Md.	553,009	0	5	1	10
Cleveland, O.	460,327	3	63	12	93
Buffalo, N. Y.	381,819	0	18	3	11
Pittsburg, Pa.	375,082	10	88	0	39
San Francisco	364,005	...	...	0	11
Detroit, Mich.	353,563	2	46	0	10
Cincinnati, O.	345,230	2	89	1	112
Milwaukee, Wis.	317,963	2	93	0	70
New Orleans, La.	314,146	0	8	0	4
Washington, D. C.	307,716	0	12	0	21
Newark, N. J.	289,634	1	129	2	81
Minneapolis, Minn.	273,825	0	13	0	10
Jersey City, N. J.	237,552	0	31	5	34
Louisville, Ky.	226,129	0	15	0	10
Indianapolis, Ind.	219,154	1	51	1	14
St. Paul, Minn.	203,815	0	30	0	13
Providence, R. I.	203,243	0	20	1	21
Rochester, N. Y.	185,276	0	12	0	10
Kansas City, Mo.	182,376	1	46	0	55
Toledo, O.	159,940	1	5	0	8
Denver, Colo.	154,920	0	8	0	13
Columbus, O.	145,414	5	30	0	5
Allegheny, Pa.	145,240	0	0	0	0
Worcester, Mass.	130,678	1	6	2	20
Memphis, Tenn.	125,018	0	0	0	3
Omaha, Neb.	124,167	0	25	0	10
New Haven, Conn.	121,227	0	2	0	0
Syracuse, N. Y.	118,880	0	20	0	14
Scranton, Pa.	118,692	0	5	1	17
St. Joseph, Mo.	118,604	1	23	1	41
Paterson, N. J.	112,801	1	29	2	21
Portland, Ore.	109,884	0	2	0	3
Fall River, Mass.	105,942	0	0	0	12
Atlanta, Ga.	101,981	1	4	0	3
Seattle, Wash.	101,169	1	3	0	1
Los Angeles, Cal.	102,479	0	35	0	40
Dayton, O.	100,709	0	11	0	11
Totals	.....	84	1,985	71	2,167
Totals Elsewhere	.....	80	2,254	92	3,293
Grand Totals	.....	164	4,240	163	5,460

TOTALS IN CHIEF CITIES.

This year Table 7 has been added, showing the number reported killed and injured in the largest cities during the past two years. The population figures are taken from the U. S. Census Bureau's estimate of 1906. These figures will be of special interest from year to year, since they will show the results of the adoption and enforcement of ordinances restricting or prohibiting the use of fireworks. Chicago and Cleveland had 12 deaths

each this year. New York had 11, Philadelphia and Boston had 6 each, Jersey City had 5 and St. Louis had 4 killed. In 1907 New York City had 22 killed, Chicago had 16, Pittsburg had 10, Philadelphia had 7, and Columbus (Ohio) had 5 killed.

Of non-fatal accidents this year Philadelphia leads with 426, followed by New York with 316, St. Louis with 229, Chicago with 202, Boston with 190, Cincinnati with 112 and Cleveland with 93. In 1907 New York had 422, the largest number of non-fatal injuries, followed by Philadelphia with 248, St. Louis with 189, Chicago with 151, Newark with 129, Milwaukee with 93 and Pittsburg with 88.

TETANUS FROM OTHER THAN FOURTH OF JULY INJURIES.

Besides the cases of lockjaw due directly to Fourth of July injuries, many other cases were reported this year, which occurred during the Fourth of July season, but which were due to penetrating injuries from nails or splinters, to crushing injuries, or to other causes. There were 166 such cases reported this year, as compared with 94 last year and 60 in 1906. The increase may be largely due to a more complete reporting of such cases rather than to an actual increase. The apparent increase, however, emphasizes the fact that in the treatment of all penetrating wounds the possibility of tetanus should be borne in mind and prophylactic measures employed.

Of the 166 cases of tetanus due to other than Fourth of July injuries Ohio reported 23, Pennsylvania 21, Illinois and New York each 17, and Missouri 12. Altogether 28 states reported cases. Table 8 shows these cases by states and will be interesting for comparison with Table 2.

TABLE 8.—CASES OF TETANUS FROM OTHER CAUSES.

	1908.		1908.
Alabama		Nevada	
Arizona		New Hampshire	
Arkansas	2	New Jersey	7
California	4	New Mexico	
Colorado	3	New York	17
Connecticut	2	North Carolina	1
Delaware	2	North Dakota	1
District of Columbia		Ohio	23
Florida	2	Oklahoma	
Georgia		Oregon	
Idaho		Pennsylvania	21
Illinois	17	Rhode Island	
Indiana	6	South Carolina	
Iowa	2	South Dakota	2
Kansas	4	Tennessee	3
Kentucky	5	Texas	4
Louisiana	1	Utah	
Maine		Vermont	
Maryland	3	Virginia	4
Massachusetts	3	Washington	2
Michigan	4	West Virginia	
Minnesota	4	Wisconsin	5
Mississippi		Wyoming	
Missouri	12		
Montana		Total	166
Nebraska		States reporting cases	29

RESTRICTIVE MEASURES.

As a result of the extensive publicity in regard to Fourth of July injuries, many efforts are being made to lessen or prevent this annual carnage. Gradually but surely, the lines are being drawn closer, and more restricting ordinances are being adopted each year. Many cities prohibit the toy pistol and the use of firearms. Many limit the size of the giant firecracker. Other cities limit the time of celebration to the one, two or three days around the Fourth, while two cities, Baltimore and Toledo, have practically prohibited all fireworks, with the result that where formerly large numbers were injured annually, now the accidents in those cities are comparatively few, most of those reported having occurred in the outlying suburbs not directly under the jurisdiction of the city ordinances. Other cities are said to have passed prohibiting ordinances, but the number of injuries reported indicate that they have not enforced them. Following an unusual number of fatalities this year, Cleveland has passed a prohibitory ordinance which should be strictly adhered to and enforced, although it is understood that "business interests" are trying to have it repealed.

PREVENTION BY SUBSTITUTION.

Another method is that adopted by St. Paul, Detroit and other cities, whereby efforts were made to change the form of celebration. At St. Paul it is said that just before the Fourth a mammoth children's meeting was held at the Auditorium, which seats 10,000 people. Here bands were playing, flags and bunting were displayed, confetti was showered about from boxes and balconies and a generally good time given, after which several coupons were given to each child, which on the Fourth would be accepted at Harriet Island in exchange for toys or refreshments. The Detroit plan was somewhat similar, but details were not learned. It is interesting to note that comparatively few injuries were reported from these cities this year.

SUBSTITUTION AND RESTRICTION COMBINED.

Possibly a combination of the two methods would solve the problem. Have the parades, the flags, the bunting, the picnics and the children's outings, but also prosecute the idiot with his giant cracker and the hoodlum who recklessly fires off his revolver, as well as all others who persist in death-dealing methods. Let the shooting of fireworks be limited to displays in the evening in charge of adults experienced in their handling.

How could we better celebrate the anniversary of our independence than by an extensive display of flags and bunting? Give to the boys bright colored soldier caps and uniforms. Give to the girls bright colored parasols and aprons. Already this modern sort of celebration is on the increase, as evidenced by the statements frequently made by dealers, who say, "Never have we sold so many flags and lanterns." In one of our large cities the remark was commonly heard: "Never have I seen so many houses decorated or so many flags displayed." Really, would it not be better for all to boycott the fireworks counter and patronize the flag store? Let us at least unite to secure a more sane and, therefore, a more patriotic celebration of the Fourth of July.

Therapeutics

VOMITING OF PREGNANCY.

A series of papers in the *New York Medical Journal* for Dec. 28, 1907, and Jan. 4, 1908, completely cover this subject, and the following includes the essential points brought out by the different contributors:

Etiology is touched on but little, and perhaps well so, since the subject is treatment, and the cause, other than that it is unquestionably an intoxication, is largely speculative. There is, however, a considerable number of factors which may modify the underlying cause of this condition so that it ranges from a trivial affair, amenable to domestic remedies, to a condition which baffles the most expert treatment and taxes the facilities of the most complete institutional equipment. Among

these may be named reflex influences such as are occasioned by pressure on nerves connected with the uterus, stomach and other abdominal viscera (and of these the most important are those due to displacement of the uterus and its adnexa) neurotic or hysterical, and toxemic. The latter naturally gives the most trouble because, primarily an autointoxication, it is almost invariably a combination of several evils.

The condition most frequently makes its appearance between the third and fifth week of pregnancy.

The liver, the great physiologic filter, has at this time a more than ordinary amount of work to do and not infrequently is at fault through inability to care for the extra burden put on it. Then, too, elimination is greater than under any other conditions, and the organs of elimination being unduly worked, may be inadequate.

Also, into the blood are poured the waste products of fetal origin, and to combat and eliminate these more work must be done.

First, then, a complete history of the patient should be taken, an opinion formed as to her normal mental or nervous temperament, and a thorough and complete physical examination made. If the condition is due to hysteria, the patient should generally be isolated and moved if possible to a situation where she will have an entire change of surroundings and attendants; the treatment then becomes mostly hygienic and suggestive.

If examination reveals a misplaced uterus (and probably a retroversion is that most frequently found), replacement should be made immediately and a properly adjusted pessary placed to maintain the correction until such time as the enlarging uterus will retain its proper position unaided. Occasionally adhesions may be found which prevent the manual correction of the fault. The condition then becomes more formidable, and recourse must be had to surgery. The same holds good in incarceration, and in this condition not infrequently corrective measures result in abortion. Erosions of the cervix, cicatrices, and polypi may be causes of the nausea and vomiting, and these if found should receive proper attention. However, surgical procedures, unless of a most trivial nature, should be reserved as a last measure, since they are liable to induce abortion, as are also such procedures as may require either a tampon of any considerable size, or packing of the vagina.

If the vomiting still persists after all corrective measures possible have been made, there remain two conclusions: the vomiting is either idiopathic, or due to autointoxication. The former term, of course, dodges the issue, but nevertheless brings the treatment under two headings, and the conclusion to be drawn from the mass of statistics seems to confirm unquestionably the comparative uselessness of drugs to meet either condition. Almost everything has been used, and with no further benefit generally than a temporary mitigation of the symptoms.

The two great difficulties that confront us are the maintenance of the patient's nutrition and the combating of the prostration caused by the vomiting. Under whichever heading we choose to meet the case, hygienic measures stand pre-eminently first and nothing should be omitted which tends to their furtherance. The diet should be of the simplest, and milk should form its bulk. One after another of the simple dishes must be tried, to be discarded if they are not retained. When the patient is first seen, if the stomach is washed out and nothing allowed but water for twenty-four hours, the bowels being thoroughly cleaned out meanwhile, milk will generally be retained. Just before giving the milk a small dose of cocain, 0.01 gram (1/6 grain) or chloretone, 0.25 gram (4 grains) may cause it to be retained. If it is retained, one or the other of these drugs may precede the further administration of food, lessening the dose each time, and, not infrequently, when a placebo is ultimately substituted for them, the food will be retained as well. Sooner or later, unless conquered, even these so-called idiopathic cases are found to have their etiology in autointoxication and elimination becomes the main point of all treatment.

The urine of course should be examined with great frequency and close watch should be kept on the elimination of solids, but an undue anxiety because of their diminution should not be felt when the intake of food or the food retained is small. A due regard to this should be kept in mind.

The bowels should be moved freely once a day. A single dose, 0.25 gram (4 grains) of calomel with a little bicarbonate of soda, 0.25 gram (4 grains) is preferable if it can be retained; if not, a daily enema must be given. If there appears to be any sluggishness on the part of the small intestines, 0.001 gram (1/60 grain) of physostigmin salicylate should be given hypodermatically once or twice a day, as may be sufficient.

Daily warm baths, with massage, plenty of fresh air, the patient kept in bed, the avoidance of the odor of cooking food, and the avoidance of all measures that tend toward excitement are of advantage. Counter irritation by mustard plaster or turpentine stupes placed over the stomach is generally a help and sometimes efficient. Also carbonated or effervescing drinks will often be retained when "still" liquids are vomited.

The one drug which has been of most service appears to be sodium (or potassium) bromid. It is best given in one gram (15 grains) doses, well diluted, by mouth, if possible; if not, by rectum, and repeated every two or three hours until the vomiting is conquered or the treatment proves useless.

Although bromids appear to be the most efficient drug, thyroid is not infrequently of use. It should be tried in small doses, say 0.20 gram (3 grains), and if retained, perhaps larger doses, up to 0.50 gram (7½ grains) every four hours for a sufficient number of times to prove or disprove its efficiency. When successful it acts by neutralizing some autoelaborated toxin, which toxin or toxins are present because of an insufficiency of the thyroid gland.

The food, as above stated, should be liquid, and preferably milk, while buttermilk (cold), koumiss, and egg albumin lemonade are useful. Generally small quantities only should be given, and at frequent intervals. When the liquid food becomes well tolerated, semisolid food and the simpler dishes, one after another, may be tried.

When all measures have failed to control the vomiting, and before the patient has actually reached a dangerous condition of prostration, consultation should be had and measures should be taken to empty the uterus. Naturally, of course, one waits as long as possible before doing this, and not infrequently waits too long; hence this caution.

ECLAMPSIA.

There is probably no condition that the medical man has to cope with that makes, from prodrome to sequelæ, such demands on his capabilities, his judgment, and his

tact as does the symptom complex of this toxemia, for intoxication it is, poorly though we may understand it and little as we may know of its etiology. Having its cause in some wrong going chemistry of either internal secretion or metabolic function, or both, its treatment must necessarily be elimination until an increased knowledge of the condition permits it to be corrective.

When it is possible to take the patient to a hospital, this should be done at once, for a case of eclampsia can at any moment present conditions which even the resources of a hospital, with its trained attendants, find difficulty in meeting, and these conditions can change with a rapidity which none but institutional resources may attempt to meet. Whatever difference of opinion there may be concerning other features of this condition, there can be no question that more cases are saved under institutional treatment than under any other, and only by reason of their increased facilities. If it be impossible to take the patient to an institution, and home treatment becomes a necessity, then the first thing to do is to prevent self injury to the patient by instructing some one present how to hold a towel, a cork, or a rubber eraser between her teeth, and to keep her on the bed.

Next, a thorough examination should be made, and if there are convulsions present or the examination starts one, a sufficient amount of chloroform may be given to allow the examination to be completed, and that thoroughly, for it is more important to know the exact conditions present than to start any treatment with an incomplete knowledge of the case.

The examination having been completed, if delivery is indicated the cervix can usually be completely dilated under chloroform without instrumentation, (*i. e.*, with the hand), forceps applied, and delivery completed. The placenta should generally then be removed, not waiting the usual twenty minutes, and the method of Credé is preferable.

Generally there is a tendency to profuse hemorrhage, and the placenta having been removed, the uterus should be thoroughly irrigated with hot physiologic saline solution and it and the vagina packed with sterile gauze. However, the packing being in readiness, it is good judgment to wait a few moments before using it to see if the hot irrigating solution provokes sufficient contraction to stop the bleeding, for if it does, there is avoided the presence of an unnecessary foreign body in the uterus.

Laceration, if present, should generally be repaired at once, always if it has caused hemorrhage. If not, the patient's condition may occasionally make the postponement of the repair advisable.

If indications for immediate delivery are not found, *i. e.*, if the cervix is not much shortened or not much softened, the os undilated, and few or no uterine contractions (and this last is the most important determining factor, since uterine contractions appear to excite the eclamptic convulsions) eliminative treatment should be started. If there is stertorous breathing, with small pupils, and slow, full, high tension pulse, and if the patient be more or less comatose, "bleeding" is indicated, and from 150 to 250 c.c. of blood should be removed, but whether or not this should be replaced with physiologic saline solution only the condition of the patient at the time can determine, certainly not if there is any edema. If it seems desirable, the quantity of saline introduced should be not less than three or four times that of the blood withdrawn. Next flush out the colon with saline solution and allow 1,000 c.c. or more to remain for absorption, provided of course that there is no edema, and particularly should the lungs be carefully examined with this in mind. Next, wash out the stomach if possible, and if done at all do it thoroughly, leaving in it 0.50 gm. (7½ grs.) of thyroid extract and 0.40 gm. (6 grs.) of calomel, with a little sodium bicarbonate. Then apply the hot pack, and when perspiration ceases, usually in about half an hour, dry the patient's skin thoroughly and keep her between blankets.

If thought advisable, veratrum viride may be given hypodermatically, in 0.5 c.c. doses until 2 c.c. have been given. The hot pack may be repeated in two or three hours if necessary, and if there is vomiting the stomach may again be washed out, leaving in it another dose of thyroid, and a smaller dose of calomel should there be reason to believe that the first dose was vomited. In short, this eliminative treatment must be kept up until the uterus can be emptied. If it seems inadvisable to wash out the stomach the thyroid and calomel may be given by mouth in the dose above referred to, and the thyroid repeated every three hours until six doses, or 3 grams have been given. It should then be discontinued.

Bladder distention is common and must be borne in mind, catheterization frequently being necessary every six or eight hours for several days after delivery.

Should stimulation be necessary, whisky by rectum and adrenalin hypodermatically, with or without physiologic saline solution, may be used to advantage. Strychnin is generally advised, but its use in conditions of cerebral excitation seems inadvisable. Certainly not more than one dose should be given and that not over 1/30 of a grain. If further stimulation appears to be needed, another drug should be substituted for it—either caffein hypodermatically, or as black coffee by the mouth, and this may be followed, if another change seems advisable, by the hypodermatic use of camphor in olive oil (1 c.c. of the saturated solution), and this may be continued at half-hour intervals.

After delivery, if a sedative is needed, there is none better than a combination of sodium bromid, 2 grams (30 grains), and chloral hydrate, 0.50 gram (7½ grains), well diluted and given by rectum. This may be repeated in an hour if necessary, but a single dose is generally sufficient. Morphin is only too frequently advised and given, but in such a condition as this it would seem distinctly contraindicated. There is no pain to combat, and usually the patient will sleep from mere exhaustion if her "nervousness" is controlled.

The quantity of morphin required to control this nervousness will of necessity be altogether more than necessary to meet every other condition, while on the other hand, if her condition is approximating coma, morphin becomes about as dangerous a drug as could be given her.

When delivery is completed the danger is by no means over, and a careful watch of the patient is necessary, for it must be remembered that the sequelæ of this condition are numerous and a patient can not be called out of danger until at least ten or twelve days have passed, and prognosis at any time before this is little more than a guess.

Should the child survive, it is in all probability also toxic. It should be given water freely, and also, perhaps, colon irrigation once or twice daily. Prognosis as to its survival should be absolutely declined.

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SATURDAY, SEPTEMBER 5, 1908.

THE ANNUAL FOURTH OF JULY RECORD.

Our sixth annual compilation of statistics on the injuries and accidents of the Fourth of July, in this issue, contains several interesting features. In the first place it shows that the steady decrease in tetanus, which has been recorded each year, seems now to have stopped, the number being practically the same as last year. However, this minimum number of tetanus cases resulted from the highest number of injuries that has yet been reported in any year since the compilation of statistics was begun, so that the actual proportion of tetanus is really somewhat less than in any previous year. That the total number of injuries, and also the total number of deaths from causes other than tetanus, were both greater than in any previous year since 1903, in spite of the widespread agitation against dangerous celebration that has been waged by the public press for years, is striking evidence of the callousness and recklessness of the public. Every one of these 5,460 injuries, 108 deaths, 104 blinded or half blinded unfortunates represents an absolutely unnecessary and wanton sacrifice to a senseless and barbaric notion of what constitutes a "good time," and is an additional evidence of the cheapness of human life in the United States. Furthermore, the greater part of these casualties represent actual violations of the law, for there are few towns or cities which have not statutes forbidding the use of revolvers and cannon crackers, at least, in Fourth of July celebrations. But no matter how much agitation there may be, or how much legislation the "city fathers" may provide, the "spirit of independence" continues to manifest itself by violating every law of public safety or common sense, and patriotism is attested by loss of lives, fingers, eyes and cuticle. All this absurd personal and civic mutilation is, after all, but one of the many manifestations of the disregard for life and property with which our country continually shocks and amazes the rest of the world.

On the other hand, we take much satisfaction in the continued success which the medical profession has met in its endeavor to hold in check the tetanus epidemic, for, while the deaths from other causes have increased from 60 to 108, the tetanus mortality has dropped in six years from 406 to 55. We have made extensive inquiries into the treatment received by those injured in Fourth of July accidents, and have yet to learn of a single case in which tetanus developed in a person who had early received a prophylactic dose of antitoxin. The successful experience with the prophylactic use of antitoxin after this class of injuries, according to both current medical literature and personal communications, has led to its much more general application in cases of accidents from other causes, in which tetanus infection seems possible; and here, too, the results have been favorable. Curative treatment still remains deplorably ineffective in Fourth of July tetanus, in which the infection seems to be of exceptional virulence as shown by the short period of incubation which averaged but seven days, and the rapid course of the symptoms which terminated fatally in 36 hours on the average. Recovery rarely follows any form of treatment of tetanus when the incubation period is less than ten days, but becomes more and more frequent as the period of incubation lengthens, a fact that must be considered in estimating the value of any method of treatment.

Besides the continued success with the prevention of tetanus, perhaps the most hopeful feature of this year's record lies in the reports from a few cities where earnest efforts have been made to hold the violence of the annual celebration in check. Baltimore and Toledo are reported as having practically prohibited all fireworks, with a very satisfactory diminution in the accidents of the day. With the example of these cities before them it is to be hoped that other communities will see the practicability of refusing longer to tolerate the useless disorder, slaughter, destruction and waste to which they have submitted every year without making any honest effort to suppress them.

MARITAL INFECTION IN TUBERCULOSIS.

If tuberculosis is actively contagious it would appear that, of all conditions, the marital relation would afford the most favorable opportunities for contracting the disease. If either of the partners is a victim, the chances of the other becoming one would seem to be especially favorable. Nevertheless statistics apparently do not support this probability to such an extent as would be anticipated, and it is in the experience of almost every observer that the percentage of husbands infected by wives and *vice versa* is not nearly so great as the opportunities would seem to render almost inevitable. This has been noticed in various medical articles, and one or two investigators at least have attempted to handle the statistics in a scientific way, as, for example, Weinberg, who used the actuarial data as to life expectancy in his discussion of the subject. There are, however, so many possible factors to be considered that positively accurate conclusions have been lacking and in most cases the figures were not sufficiently extensive to warrant drawing such conclusions.

The latest published investigation is that of the late

Mr. Ernest G. Pope, of the Adirondack Sanitarium, which has been very extensively edited and revised by Professor Karl Pearson in the Draper's Company Research Memoirs under the title of "A Second Study of the Statistics of Pulmonary Tuberculosis: Marital Infection." Mr. Pope in his studies took up the subject of the influence of assortative mating and this has been much more extensively developed by Professor Pearson in his additions to the paper. It is a well known fact that there is a tendency among the subjects of certain diseases to select in marriage those with like marked tendencies to themselves. This has been especially noted among the insane, and while apparently it was not admitted by Mr. Pope as a factor to any great extent in producing marital tuberculosis, Professor Pearson shows that it must be considered. His conclusions are summed up in the slightly modified words of Mr. Pope: "It would seem probable then that (1) there is some sensible but slight infection between married couples; (2) this is largely obscured or forestalled by the fact of infection from outside sources; (3) the liability to the infection depends on the presence of the necessary diathesis; (4) assortative mating probably accounts for at least two-thirds and infective action for not more than one-third of the whole correlation observed in these cases.

"But demonstration of this result depends on the acceptance of the inherited diathesis to be effective, and the existence of assortative mating of equal intensity in the cases of want of mental balance must prevent dogmatism." He speaks of the necessity of more complete data in such statistics. It is especially important, he says, that the age of husband and wife at marriage and the age at onset and death should both be recorded. Similar data as to the age at onset and death of the parent at the birth of the child and the age at onset and death of the child should also be secured. The family history is essential: "if we find that the marriage of two ultimately tuberculous persons took place before either was suspected of the disease and that there is in such cases a larger percentage of family histories of tuberculosis than in the case of non-married tuberculous individuals, we should have definite evidence of the assortative mating that seems probable. If, on the other hand, the percentage were smaller we would have definite evidence for the infection theory."

In an appendix, tables are given which show that the insane, epileptic, markedly eccentric, or alcoholic, do tend to mate together, and while more extended data on this point are still wanted, the facts so far as ascertained should be, as Professor Pearson says, vigorously impressed on those who dogmatically assert that the association of tuberculous husband and wife beyond a due proportion in a population taken at random can only be attributed to infection. They must be prepared to admit that insanity is still more transmissible between husband and wife, though in all forms except perhaps paresis and some toxic insanities, one does not usually think of attributing it to a bacillus or to any other organism.

Professor Pearson's views on the importance of the hereditary element, or perhaps we should say, the congenital diathesis, are well known, but he has in his favor the results of the scientific discussion of statistics. There is a wide field yet to be cultivated, and perhaps the question can be considered absolutely decided only after a much larger amount of material has been obtained for investigation. The subject is an excessively complicated one when we take into account all the possible factors which will have to be considered in its solution. The ubiquity of the tuberculosis infection is in itself a very important factor. If the general practitioner could be thoroughly interested in such questions, and especially in this question of tuberculosis, which is probably the most important disease afflicting mankind at the present time, and could be induced to make the needed careful observations and records, data might be obtained that would settle all such questions as the etiology, etc., beyond cavil. At present it would seem to be fairly well established, if statistics discussed according to the mathematical formulas of probability are of any value, that consumption is not actively contagious between husband and wife, and that a certain previous constitutional condition or predisposition is essential for its contagion to act in any case. The question of an acquired immunity, of course, intervenes here and still further complicates the matter, but probably does not practically affect the general conclusions above stated. It may be perhaps a subject amenable to statistical investigation.

We may decry statistics, but the fact is that all our certain knowledge in these matters of sanitary importance is obtained only through the proper application of their laws. Intermarriage of consumptives or those of known predisposition to the disease should be discouraged, not only on account of the danger of propagating offspring with like pathologic tendencies, but also because of the actual physical disabilities of the tuberculous, especially in the female, for fulfilling the duties of married life. There still remains, also, as stated above by Professor Pearson, a certain possible risk of contagion, though this has apparently been overestimated. The paper emphasizes a fact hitherto little appreciated—the possible danger from selective preference of the tuberculous for each other in choosing married partners, with its consequent bearings on the propagation of the disease.

REVOLVING HOUSES.

Somewhat more than twenty years ago a popular farce was constructed on the "wildly fantastical" idea—as the authors termed it—of a summer hotel which was made to revolve by means of a windlass and mule power. Since then revolving habitations have been designed and constructed in sober earnest; they have been made

to turn on pivots, so that their rooms could face in any direction. Dr. Pellegrin and architect Petit, both of Paris, together devised such a house; in its axis of rotation there was a shaft, through which passed the water pipes. A gas engine moved the platform on which the structure was erected; and the machinery could be harnessed to clockwork. Such a house was intended especially for invalids, for whom it was most appropriate. Less ambitious "shelters" having one of the four sides entirely open, have long been in use in the outdoor treatment of consumption, whereby the sufferer can easily bask in the sunshine, or can shield himself from snow, rain or unduly fierce winds—an excellent contrivance for the sick.

It is now planned[1] to build on the northern shore of Long Island, New York, a house which, by means of electricity, will revolve on a pivot. One will need but to press the button for the view to be changed or the breezes to be caught, as may be desired. There are to be noiseless ball-bearings; and bells will tinkle on the piazzas to warn those about to leave or enter whenever there is to be a turning. The lawns will be so laid out that the front entrance will fit at any point of the compass. The scheme is the result of "many years of thought" on the part of the projector, and has grown out of a desire for "genuine home comfort."

On little reflection one will conclude that the ideal state projected will not be realized in such a house. In getting the shade for the room in which he is luxuriating, the owner, unless he lives like a hermit, will be sure to inflict the glaring sunshine on someone else. Nor would the lack of "genuine home comfort" be experienced only by guests or other members of the family. Should the owner himself, after dining out, not wisely but too well, arrive to find the front door, which he left facing due north, supplanted by the tradesmen's entrance, it is not hard to imagine the mental anguish that would be experienced in attempting to find a keyhole which had actual as well as psychic instability. The sight, too, of the iceman, well loaded with his product, racing around the gravel walk in a vain effort to reach the rear entrance while he was relentlessly pursued by the front piazza, would cause one to question whether a more conventional, if less exciting, homestead might not be desirable.

THE HOBBIES OF PHYSICIANS.

Hobbies, apart from medicine, should be developed by the physician during his virile years; so that in the afternoon and evening of his life they will sustain and comfort him, and provide such light interest and occupation as are essential to most venerable men who have in their prime been of a robust and achieving habit. Many examples from the varied walks of life, of such fads and hobbies, come at once to mind. Salisbury knew much of electricity, Gladstone of Homer, Chamberlain of orchids. Balfour is immersed—literally, some fear—in psychic research; Lodge has become absolutely submerged in this regard. Joseph Choate knows a great deal more than the law; that is why he is so excellent a lawyer; and why it has been said that there are three kinds of lawyers—those of the old school, those of the new school, and Choate. Billroth was a superb pianist; Strümpell is a clever violinist; many among our colleagues are excellent performers on musical instruments, and are all the better surgeons and physicians, for their genial and humanizing accomplishments, all the better qualified to comprehend the sufferings they must alleviate. To have a hobby of any sort, one need not be a producer or originator; to be an appreciator will be all-sufficient. Especially with regard to literature and the arts would it be well that the ambition to be original should not generally prevail; "'tis better so," we might well observe with Mulvaney, when we reflect on the present appalling literary over-production. We had best offer up all our originality to Medicine, who is an exceedingly jealous mistress; as one will surely find who would presume to exalt his hobby from the secondary position it should occupy, above her claims. But we can all be appreciators. A taste for literature is one of the greatest sureties of a happy old age. There was a man who, having read but one of Thackeray's books, deliberately refused to read any of the others, reserving for his latter years substance so productive of quiet pleasure. Another old gentleman kept a diary, in which he preserved carefully the dates when he saw the first buds on his trees; when the first robin appeared; when he heard the first bobolink. "Do not," says Osler, "become too deeply absorbed in your profession to exclude all outside interests. No matter what it is, have an outside hobby. When tired of anatomy refresh your minds with Holmes, Keats, Shelley or Shakespeare." And to these may well be added the works of our fellow professionals, Oliver Goldsmith, Sir Thomas Browne, Weir Mitchell and Sir James Paget. It is the all-'round man who succeeds best, in medicine as elsewhere—the physician who is thoroughly informed in his own work, and who knows, besides, something regarding the things which are vital to others.

1. New York Times, July 7, 1908.

PUBLIC OPINION AND THE FOURTH OF JULY HOLOCAUST.

Public opinion is gradually arraying itself against the present intolerable method of celebrating the Fourth of July, whereby so many people, mostly bright, active children, are condemned to an agonizing death by lockjaw or to be killed outright, and whereby thousands annually are rendered blind, lose legs, arms, or hands or are otherwise maimed for life. That public opinion will eventually force the lessening or prevent this annual carnage is evidenced by the fact that each year more cities are adopting ordinances to restrict the sale of fireworks. Several large cities have limited the sale and use of fireworks to two, three or four days preceding the Fourth, while some have rigidly limited the nuisance to one day. Two cities, Toledo and Baltimore, have practically prohibited all fireworks for the past two and three years respectively, with the result that

the numbers of killed and injured are far less than in other cities of equal size. This year Cleveland had a record of 12 persons killed and 93 injured. This so aroused the people that the city council has passed an ordinance prohibiting hereafter the use of any kind of fireworks in the celebration of the Fourth of July. We understand that manufacturers of fireworks are trying to secure a repeal of the ordinance, but it is hoped not only that the law will stand and be vigorously enforced, but also that other cities will adopt and enforce similar measures.

Medical News

CALIFORNIA.

Beriberi in Alviso.—Beriberi is reported present on ranches in Alviso, Santa Clara County, where 41 cases are said to exist.

Smallpox in Orphanage.—The Good Templars Orphans' Home, near Vallejo, has been quarantined on account of the appearance of 5 cases of smallpox.

Medicine Vendors Licensed.—The city council of Santa Cruz has passed an ordinance providing for a license of $50 a day for medicine vendors accompanied by shows.

Prohibits Sample Distribution.—Sacramento has passed an ordinance prohibiting the distribution of samples of drugs and medicine unless they are actually handed to adults.

Faculty Members Resign.—Ten members of the faculty of the College of Physicians and Surgeons, San Francisco, have resigned. This is said to be the culmination of internal dissension which has continued in the college since 1906.

Physicians Injured.—Dr. Alden M. Gardner, Belmont, sustained a dislocation of the right shoulder and contusions by being thrown from a street car in San Francisco, August 22. ——Dr. William F. Jones, San Rafael, who was operated on for malignant disease of the abdominal cavity, is reported to be critically ill in the College Hospital, San Rafael.——Dr. Melvin B. Huff, Colona, while cranking his automobile August 4, suffered a Colles' fracture of the right arm.

Personal.—Dr. James W. Jesse has purchased the contents and appliances of the old Santa Rosa Hospital.——Drs. J. Underwood Hall and Roscoe A. Whiffen have resigned as members of the board of health of San José.——Dr. John F. Burns has been appointed a member of the board of health to fill vacancy.——Dr. Frank A. McMahon, chief surgeon of the United States Veteran's Home, Yountville, has resigned.——Dr. A. Lincoln Cothran has been elected president, and Dr. John F. Burns, secretary and health officer, of the San José board of health.——Dr. Luther M. Leisenring has been made a member of the board of health of Placerville.

ILLINOIS.

Chicago.

Physician Exonerated.—Dr. O. J. Price was exonerated from all blame in connection with the death of a young child, August 19. It was found that the prescription for creosote given by Dr. Price was filled by a druggist's clerk with 90 per cent. carbolic acid.

Communicable Diseases.—To the total of 246 cases of communicable diseases reported during the week ended August 29, diphtheria contributed 86; typhoid fever, 47; tuberculosis, 41; scarlet fever, 37; whooping-cough, 13; measles, 12; pneumonia, 5; chickenpox, 2; and diseases of minor importance, 3.

Personal.—Dr. and Mrs. Edward L. Moorhead and son have returned from Europe.——Dr. Jacob Frank has donated 400 volumes on medical and surgical subjects to the Columbus Hospital to provide a reference library for internes.——Dr. P. J. H. Farrell has been elected commander-in-chief of the Army of the Philippines.——Dr. Frederick W. Mercer was seriously injured by a fall from the third floor to the parlor floor of his house, August 9.

Mortality of the Week.—There were 584 deaths reported for the week ended August 29, 9 more than for the preceding week and 32 fewer than for the corresponding week of 1907, the respective death rates being 14.9, 13.84 and 15.24 per 1,000. Chief among death causes were the following: Acute intestinal diseases, 173; consumption, 65; violence (including suicide), 48; heart diseases, 47; cancer, 33; and nephritis, 31. Diphtheria and typhoid fever each caused 9 deaths; scarlet fever, 5; and whooping-cough, 1 death, during the week.

KENTUCKY.

State Board of Health Meets.—The annual meeting of the State Board of Health was held in Louisville, August 21. The board resolved to levy an assessment on the members to defray the expenses of a commissioner to investigate the water conditions of the Ohio River and its tributaries. The secretary was authorized to make the selection and instruct the commissioner in his duties. The consolidation of the medical schools was endorsed and the requirements of the American Medical College Association were adopted by the board. The executive committee of the board will confer with a similar committee from the university regarding the curriculum. At the last state board examination 82 applicants appeared, one of whom withdrew, one was expelled for fraud, 45 passed and were licensed, and 35 failed. The board is making an effort to prosecute all quacks and illegal practitioners in the state, especially some who are alternating in Kentucky, Indiana and Ohio.——On April 3 the board completed the thirtieth year of its existence. It was created in 1878 in order to cope with yellow fever. The board recommended the cooperation of physicians to obtain the placing of the names of Drs. Pinckney Thompson, R. W. Dunlap and R. C. Thomas in the Hall of Fame in the state capitol.

MARYLAND.

Increase in Typhoid.—The state health department reports an increase in typhoid in July as compared with June of 120 per cent., and this is attributed to the prevalent drought and continued high temperature.

Hospital Not Needed.—The comptroller of the state, Dr. Joshua W. Hering, declares that there is no need for a hospital at Annapolis, owing to the proximity of the city to Baltimore. The legislature last year appropriated $50,000 for a hospital at Annapolis, but the governor reduced the appropriation to $25,000.

State Medical Examiners Suggested.—The governor suggests the appointment of state medical examiners to visit factories in search of tuberculosis patients; when found the patients are to be treated free until cured or until death occurs. He proposes that a new department be created as an adjunct to the Bureau of Labor and Industrial Statistics. He also proposes segregation of the tuberculous insane.

New Building for State Society.—The work on the new building for the Medical and Chirurgical Faculty of Maryland has commenced. There is on hand $26,000 from the Osler fund, the Friedenwald fund, and paid subscriptions. The available unpaid subscriptions the state appropriation and the estimated value of the present property amount to $35,000. The expenses so far have been $1,000, leaving available funds amounting to $60,000. Up to the present time 344 physicians of Baltimore, 37 physicians outside of Baltimore, 36 business men and 89 pharmacists have subscribed to the fund.

Resolutions.—At the August 20 meeting of the Baltimore County Medical Association resolutions were adopted setting forth the loss sustained by the association in the death of the late Dr. George Junkin Preston and condoling with his family.——At the same meeting resolutions were adopted that the Baltimore County Medical Association has among its members more physicians who are interested in the care and treatment of the insane than any other county medical society; that it views with alarm the proposed division of authority at the Springfield Hospital for the Insane; that it desires to express its most emphatic disapproval of this division of authority which it is felt would be a step backward in the care of the insane; that it registers its protest against this division of authority and expresses its confidence in its executive ability of the present superintendent, Dr. Joseph C. Clark, successfully to carry on the work begun so ably by the late Dr. George H. Rohé.

MASSACHUSETTS.

Communicable Diseases.—An epidemic of diphtheria was reported August 24 at the South Athol fresh air camp.——Despite rumors to the contrary, Boston is said to be free from scarlet fever.

Health Report.—During July there were reported in the state 893 deaths from infectious diseases, 110 deaths from acute

lung diseases, 203 from tuberculosis, 30 from diphtheria, 20 from typhoid fever, and 17 from measles.

Personal.—Dr. Joseph H. Pratt, Boston, sailed from Liverpool, on his return, August 11.——Dr. Thomas E. Cavanaugh, Holyoke, is in Paris.——Dr. Benjamin T. Loring, Roslindale, Boston, has been elected a medical inspector of schools to succeed Dr. Henry M. Emmons.——Drs. Charles L. S. Swan and Michael Glennon are the medical members of the committee appointed by the selectmen of Stoughton, to investigate the matter of a sewerage system for the town.

MISSISSIPPI.

Election of Officers.—At the annual meeting of the faculty of the Mississippi Medical College Dr. William W. Hamilton was elected president; Dr. Nathan L. Clark, vice-president; Dr. Samuel H. Hairston, secretary; O. W. Bethea, treasurer; and Dr. T. Alexander Brown, dean.

Practitioners Must Show License.—Dr. Samuel H. McLean, Jackson, secretary of the State Board of Health, is preparing a circular to each county health officer, in which he calls attention to the section of the medical code regulating medical practitioners, and to the fact that the prohibition against practicing medicine without a state license is being disregarded, not only by older practitioners, but by medical students. He states furthermore that it is a matter of common report that men who have failed in the examination have returned to their communities or some other, and commenced practicing medicine.

NEBRASKA.

State Board Appointments.—Dr. W. H. Wilson, Lincoln, has been reappointed by the state medical board as health inspector for the coming year, and Drs. J. H. Wallace and C. F. Ladd, Lincoln, have been made members of the dental board.

New Institution Formed.—The Eaton Laboratory for the Study and Prevention of Tuberculosis in Children has been organized in Lincoln as an auxiliary of the Nebraska Orthopedic Hospital. It is intended to accomplish three principal results: First, to make special study of the records of the results at the hospital and of the care of the tuberculosis children in general; second, to record children suffering with tuberculosis in Lincoln or elsewhere in the state, who are in need of special care, and give special instruction when advisable and to arrange with parents to have children placed in the hospital; and third, to conduct a campaign of education on all questions relating to health of children, and the cure of those who are ill with tuberculosis. Hon. H. N. Eaton is president of the laboratory; Dr. H. B. Ward, dean of the College of Medicine of the University of Nebraska, a member of the board of directors; and Dr. H. Winnett Orr, assistant superintendent of the Nebraska Orthopedic Hospital, director of the laboratory.

NEW YORK.

Used Physician's Name.—George W. Doty, alias Dr. James Doty, has been arrested for practicing medicine in New Rochelle under a false certificate and assumed name. The original Dr. James Doty has been dead five years and was a graduate of the University of New York, class of 1837.

Working Against Bovine Tuberculosis.—The commissioner of state agriculture has made plans for the eradication of bovine tuberculosis with the leading representatives of various farms and dairy organizations and the directors of agricultural colleges. Methods of educational work were discussed. The nature of bovine tuberculosis will be explained by competent speakers at farmers' institutes throughout the state, and demonstrations will be given.

Plans for Long Island Hospital.—Bayside, Long Island, is soon to have an up-to-date hospital. A stock company has been formed for the purpose of the erection and maintenance of such an institution which will be incorporated under the title of the Bayside Infirmary Company. A lot has been purchased on Broadway overlooking Little Neck Bay. The hospital will be ready for occupancy by May 1, it is hoped. Physicians may send their patients here and care for them personally.

Buffalo.

Tag Day.—Tag day for the benefit of the District Nursing Association was held September 4. The public extended generous aid to this charity, appreciating the excellent work done in conjunction with the tuberculosis committee of the Charity Organization Society.

Personal.—Health Commissioner Wende, who, while on his way to attend the American Public Health Association at Winnipeg, Man., was taken ill and obliged to return to Buffalo, is still confined to his bed.——Dr. George F. Cott is spending several months in Europe.——Dr. Charles Howard, chairman of the New York State Prison Commission, is ill in Buffalo.

New York City.

Bequest to Charity.—The will of Sigmund Rosenwald bequeathes $5,000 to the United Hebrew Charities, $1,000 to the Montefiore Home, and $500 to the Mount Sinai Training School for Nurses.

Wants Prison Sentence Rather Than Fine.—Dr. Darlington, Commissioner of the Health Department, has requested that hereafter violations of the pure food law shall be made punishable by imprisonment instead of by fine. He claims there are scores of groceries throughout the city that are selling jams and jellies in which sulphurous acid is used as a preservative.

New Rockefeller Hospital.—Plans have been filed for the main hospital building and isolation annex of the Rockefeller Institute for Medical Research. The main building is to be a seven-story brick edifice, and the isolation wards will be in a two-story building connected with the main building by steel bridges. The estimated cost of the hospital is $350,000, the isolation annex $50,000, and the additional power house $4,000.

Eye Trouble from Public Baths.—Dr. Herbert J. Knapp, oculist of the Eastern District Dispensary, says that at present there are a large number of cases of catarrhal conjunctivitis, due to bathing at the public baths in that vicinity. A sewer empties into the river a short distance above the bath. The attention of the Board of Health has been called to the existence of this epidemic and has urged the removal of the bath.

Tuberculosis Exhibit in Battery Park.—The department of communicable diseases of the Health Department has just given a stereopticon exhibition in Battery Park for the purpose of helping along the war on tuberculosis. The show demonstrated graphically what the Health Department is doing at present to prevent, supervise and treat pulmonary tuberculosis, and to instruct the people how not to get the disease and how to avoid giving it to others.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended Aug. 22, 437 cases of tuberculosis with 153 deaths; 157 cases of diphtheria with 12 deaths; 132 cases of typhoid fever with 14 deaths; 66 cases of measles with 5 deaths; 72 cases of scarlet fever with 5 deaths; 17 cases of whooping cough with 7 deaths; 7 cases of cerebrospinal meningitis with 3 deaths, and 13 cases of varicella, a total of 901 cases and 199 deaths.

Junior Sea Breeze Hospital.—Dr. L. R. Williams reports that the rapid recovery of the sick babies at the Sea Breeze Hospital has so depleted the infant colony that only 38 of the 65 available beds are at present occupied. All mothers of sick babies are urged to take advantage of the present accommodations and have their children treated. During the summer of 1907 the infant mortality resulting from summer complaint was reduced from 253 in 1906 to 226 last year, although the summer of 1907 was more disastrous in its effect on babies than the year previous.

PENNSYLVANIA.

Communicable Diseases.—Several cases of cerebrospinal meningitis were reported from Pottsville, August 24.——Typhoid fever continues prevalent in the Northampton County jail, Easton, where the fourteenth case was reported on August 25.——The typhoid fever epidemic in Spring City and Royersford does not show any sign of abatement. On the contrary, several new cases were reported during the past week. The state health board is in charge, and all houses are being placarded as soon as a new case is reported. Posters have been placed about the town warning the public to boil all water for drinking and cooking. The local water company has cleaned one-half of its reservoir and the entire water system will be thoroughly flushed.——Typhoid fever continues epidemic at Canonsburg and 34 cases were reported up to August 24. Six new cases were reported in the Morganza Reform School on the same day, making the total number of cases in that institution 34.——Typhoid fever is epidemic in the northeastern section of the city of Reading, and since August 1, 74 patients have been removed to the various hospitals while as many more are being treated at home.——In Wilkes-Barre typhoid fever is also prevalent, and 7 new cases

were reported August 28, making a total of 41 for the week. Dr. Coleman of the state board of health has charge of the investigation.

Philadelphia.

Vital Statistics for July.—During July the number of deaths reported was 2,598, and the total births for the same period was 3,505. The department of medical inspection ordered 432 fumigations, examined 26 cases for special diagnosis, collected 145 cultures, made 116 injections of antitoxin, and performed 27 vaccinations.

Guarding Milk Supply.—Dr. Neff, director of Public Health and Charities, is using every effort to safeguard Philadelphia from the danger of typhoid contagion, as the result of the epidemic of this disease in nearby towns. There are many dairy farms in the vicinity of the infected places, from which milk is shipped to the city. Specimens of this milk are collected daily on arrival and analyzed bacteriologically in the municipal laboratories.

New Children's Department for Woman's Hospital.—Plans and specifications have been prepared for a new department for children in the Woman's Hospital. The building will be a three-story structure of colonial design and will be built of red brick with blue marble trimmings. The interior wall and partitions will be of terra-cotta fireproofing. The building will contain eye, ear, throat, medical and children's clinics, with wards and baths on each floor. A diet kitchen and *x*-ray room are also provided.

Health Report.—The total number of deaths reported for the week ended August 29 aggregated 389. This is a decrease of 101 from the previous week, and a decrease of 45 from the corresponding week of last year. The principal causes of death were: Typhoid fever, 5; measles, 2; pertussis, 4; diphtheria, 5; consumption, 37; cancer, 23; apoplexy, 11; heart disease, 34; arteriosclerosis, 6; acute respiratory disease, 21; enteritis, 76; hepatic cirrhosis, 8; appendicitis, 4; Bright's disease, 25; premature birth, 10; congenital debility, 12; senility, 7; suicide, 3; accidents, 10; and marasmus, 7. There were 165 cases of contagious disease reported with 11 deaths, as compared with 120 cases and 11 deaths reported in the preceding week. Typhoid fever shows a marked increase, 102 cases being reported. This is nearly double the number reported in the previous week and four times as many as were reported in the week of July 17. Investigations made by Chief Medical Inspector Dr. Cairns show that in the great proportion of cases the disease was contracted outside of the city.

SOUTH DAKOTA.

Addition to Hospital.—An addition is being built by Dr. C. W. Hargens to his hospital in Hot Springs, which will increase the accommodations of the institution to 48 beds.

State Board Election.—At the annual meeting of the State Board of Medical Examiners, held in Deadwood, the following officers were elected: President, Dr. Leslie G. Hull, Watertown; vice-president, Dr. Harry S. Graves, Hurley; and secretary, Dr. Hiram E. McNutt, Aberdeen.

Personal.—Dr. Romeo R. Stevenson, Sioux Falls, was recently injured in a runaway wreck between Paris and Lyons, France.——Dr. A. V. Rock, Hoven, narrowly escaped drowning by the capsizing of a boat in the Missouri River, near Le Beau.——Dr. H. J. F. Bright, White Lake, has been appointed a member of the State Board of Medical Examiners.——Dr. Arthur B. Hawes, Elk Point, has been appointed examining physician on the board of lunacy of Union County, vice Dr. Leroy S. Moore, resigned.

TENNESSEE.

Colored Physicians Meet.—At the annual meeting of the Colored State Medical Society, held in Clarksville, July 14 and 15, Dr. Robert T. Burt, Clarksville, was elected president; Dr. R. L. Fields, Mason, secretary; Dr. Charles O. Hunter, Columbia, treasurer; and Dr. J. H. Hale, Nashville, historian.

Infectious Diseases.—An epidemic of smallpox is reported among negroes from McMinn County, near Niota, where 10 or 15 cases are said to exist.——An epidemic of throat trouble is reported from Henning, where several deaths have occurred.——Franklin is reported to have an epidemic of typhoid fever.

Medical Library.—After many years' work a modern medical library is almost ready for the use of physicians of Nashville and Davidson County. The library will have about 3,000 volumes and many medical journals will be kept on file. The library will be kept and cared for as a separate part of Carnegie Library.

Personal.—Dr. J. C. Drennen, Woodbury, was assaulted August 17 and sustained a fracture of the skull.——Dr. Rufus E. Fort, Nashville, has been appointed chief surgeon of the Tennessee Central Railroad.——Dr. William H. Smith, Memphis, has been appointed United States prison physician, vice Dr. Joseph T. Spence, resigned, to accept the position of surveyor of customs and collector of the port.——Dr. William E. McCampbell, Nashville, has been elected chairman of the Civic Sanitary League.

TEXAS.

Diphtheria Epidemic.—Diphtheria is reported from Livingston and in the neighborhood of Round Top and Littig.

Hospital for Denison.—The Denison Medical Society presented a proposition to the city council August 10, offering to furnish ground and equipment for a hospital, provided the council would appropriate $50,000 for the construction of a building and $3,000 a year for its maintenance.

Fire in Medical Journal Office.—The Continental National Bank Building, Fort Worth, in which the office of the *Texas Medical Journal* is located, caught fire July 19 and considerable damage was caused, but fortunately the files, indices, legislative records, etc., were not irreparably injured. Local officials view this as a demonstration of the importance of providing a fireproof depository for the records and library of the society.

State Board Meeting.—At the annual meeting of the State Medical Board, held in Fort Worth, August 3, Dr. James D. Osborne, Cleburne, was elected president; Dr. John D. Mitchell, Fort Worth, vice-president; and Dr. Marquis E. Daniel, Honey Grove, secretary-treasurer. A resolution was adopted providing that in cases where license to practice medicine in the state had been granted, and the individual to whom such license was granted uses it in the interest of advertising hospitals, the license would be revoked.

Personal.—Dr. and Mrs. John O. McReynolds and daughter, Dallas, returned from Europe July 29.——Dr. Manton M. Carrick, Dallas, has been appointed assistant quarantine inspector, with headquarters at Galveston.——Dr. George W. Emory, Bryan, was painfully hurt in a runaway accident August 11.——Dr. Cuvier Lipscomb, Denton, in stepping from a street car August 16, fell and sprained his hip.

UTAH.

Tuberculosis Not Admitted.—The regents of the University of Utah have promulgated a decree that no teacher, student or employé infected with tuberculosis will be admitted hereafter to the class rooms or buildings of the university.

Personal.—Dr. Robert S. Joyce, Ogden, has resigned from the board of education.——Dr. David C. Budge, Logan City, has been elected medical director of the new Utah-Idaho Hospital.——Dr. Edward J. Rich, Ogden, is said to be seriously ill with typhoid fever.

Health of Salt Lake City.—During July there were only 72 deaths in Salt Lake City, or 16 fewer than for the corresponding month of last year. The birth record for the month was 194. There were reported 86 cases of communicable disease, as follows: Whooping-cough, 46; smallpox, scarlet fever and diphtheria, each, 10; measles, 5, and typhoid fever, 4.

VIRGINIA.

Dispensary Established.—Drs. C. E. Verdier and Karl Osterhaus have established a surgical dispensary in Norfolk, working in connection with the City Dispensary and Infant Sanitarium at Virginia Beach.

Personal.—Dr. Stanley H. Graves, Norfolk, has been appointed chief surgeon of the Norfolk & Portsmouth Traction Company.——Dr. Charles W. Massie, Richmond, was thrown from his buggy August 17, and suffered a fracture of the skull and other injuries.

WISCONSIN.

Gives Hospital to City.—Charles B. Clark, Neenah, has given the city a hospital costing $75,000, in memory of his sister, who died several months ago.

Sample Ordinance Passed.—The ordinance framed by the commissioner of health of Green Bay, Dr. Henry Rhode, prohibiting the distribution of "patent" and proprietary medicines in the city, under penalty of fine, has been passed.

Communicable Diseases.—Kossuth reports 41 cases of smallpox and 16 houses are in quarantine.——At a meeting of Eau Claire physicians it was decided to quarantine all local cases of spinal meningitis, of which 15 cases are reported in the city.——Oshkosh reports an epidemic of typhoid fever.

Personal.—Dr. William A. Sickels, Milwaukee, has been elected professor of electrotherapeutics in the medical department of Marquette University.——Dr. John W. Fisher has been elected medical director; and Drs. George A. Harlow, William Thorndike and David E. W. Wenstrand, assistant medical directors of the Northwestern Mutual Life Insurance Company, Milwaukee.——Dr. H. B. B. Poppe, Wautoma, has been appointed United States pension examining surgeon, vice Dr. Charles A. Lathrop, resigned.——Dr. Wilhelm Becker has resigned as a member of the faculty of Milwaukee Medical College.——Dr. Uranus O. B. Wingate, Milwaukee, has been made medical director of the Peerless Springs Hotel and Sanitarium, Fox Lake.

Medical Staff Selected.—The Misericordie Hospital, Milwaukee, announces the following medical staff: Medicine—Drs. Walter H. Nielson, Louis F. Jermain, Nelson W. Reynolds and Joseph A. Purtell; gynecology—Drs. Dennis J. Hayes, Robert G. Sayle and Peter H. Jobse; obstetrics—Drs. Timothy L. Harrington, Willard T. Nichols, Milo R. Hewitt, Henry McCabe, William Jobse, Carl Wagner, Thomas Fitzgibbons, Joseph P. McMahon; Charles M. Schoen, John T. Scollard, Daniel Hopkinson, Edward J. Purtell, Frank R. Wasielewski, William F. Lochemes and William H. Halsey; diseases of children—Drs. Lorenzo Boorse and A. W. Meyers; nose and throat—Drs. Franz Pfister, Herman Stolte and James Cavaney; skin diseases—Dr. Albert H. Purdy; eye and ear—Drs. Anthony J. Taugher and James A. Bach; and nervous diseases—Dr. William F. Wegge.

GENERAL.

Pure Food and Drugs Congress.—We referred recently to the First International Congress for the Repression of Adulteration of Alimentary and Pharmaceutical Products to be held in Geneva next week. Further information just received shows more fully the objects of the congress, which are to determine definitions that may serve as standards for unadulterated products and to establish a sort of international alimentary codex of commercially pure products. Besides the general opening meeting, at which organizations will be effected and addresses made by the official delegates, there will be five general sessions on the following divisions: 1, wines, alcohols and other intoxicating beverages; 2, milk, butter, cheese, eggs, edible oils and fats, preserves, meats, pork butchers' meat, and salted provisions; 3, cocoa, chocolate, coffee, tea, cereals, flour, semolina, starchy products, bread, alimentary pastes, pastry, sugar, sirup, confectionery, honey, mustard and spices; 4, natural mineral waters, artificial gaseous waters, lemonade, cooling effervescent drinks, crude materials, chemicals and galenical products employed in pharmacy. The published list of members and delegates is a long one, including twenty-one from the United States. The number expected to attend from European countries is naturally much larger, the list of French delegates and members far outnumbering those of any other country.

CANADA.

Provincial Medical Association Meeting.—The ninth annual meeting of the British Columbia Medical Association was held in Vancouver, August 20 and 21. Dr. John M. Pearson, Vancouver, presiding and Dr. R. Eden Walker, New Westminster, acting as secretary. The more interesting discussions hinged around three papers. The first was that read by Dr. R. V. Dolbey, Victoria, entitled "A Plea for the More Rational Conception of Appendicitis." Reference was first made to the starvation method as advocated by Ochsner, but which was considered madness by the French school; and the speaker thought every man should follow his own opinion and views in the matter. Should the doctor operate on sight was the first interesting point taken up. While in America they believed in operation on sight, in Europe they inclined to the "ward off" principle. The speaker prophesied that in ten years' time surgeons will look on appendicitis from a blood-pressure standpoint. Dr. Joseph Price, Philadelphia, stated he had not heard such a masterly discussion on appendicitis for over a quarter of a century. In his opinion, while Ochsner's treatment had been dangerous and fatal in many cases of children, yet the English surgeons were not aggressive enough; he believed in operation at sight. Dr. W. D. Brydone-Jack, Vancouver, read an exhaustive paper on the medical inspection of schools. Vancouver is farther ahead than any other place in British Columbia, as they have appointed a medical inspector of schools. South Vancouver also has a medical inspector. This is all that has been done in this direction in British Columbia. The speaker said that it would pay that province to have a staff of medical men paid by the education department of the province under the supervision of a medical board, giving lectures in hygiene and inspecting the school children in the different districts. Dr. Arthur L. Kendall, Vancouver, presented a paper on pure milk. In British Columbia there is no law of any kind governing the sale of milk. The conditions under which milk is marketed in Vancouver are a lasting disgrace; there is no one to whom power is delegated to prosecute; the situation calls for the gravest consideration. The amalgamation of all medical associations in the west and also of all similar bodies throughout Canada was discussed, but no action was taken. The election of officers resulted as follows: President, Dr. Charles J. Fagan, Victoria; vice-president, Dr. John H. Hogle, Nanaimo; treasurer, Dr. James D. Helmcken, Victoria (re-elected); and secretary, Dr. R. Eden Walker, New Westminster (re-elected).

LONDON LETTER.

(From Our Regular Correspondent.)

LONDON, Aug. 22, 1908.

The Mortality of Occupations.

Dr. Tatham, superintendent of statistics, has presented to the registrar general a report on the occupational mortality in the three years 1900-02, which has just been published, and is a continuation of a somewhat similar report made ten years ago. The time which has been taken in the preparation of the report may seem considerable, but it is explained by Dr. Tatham's account of the difficulties encountered and the numerous sources of error against which he had to guard. His object has been to furnish material for continuing the study of the mortality of workers in various occupations. A valuable aid to increased accuracy has been given by the inclusion in the census of 1901 of returns showing the original occupation of persons who from age or infirmity had become unable to work and who were formerly described only as "retired." Dr. Tatham has taken the interval between the twenty-fifth and sixty-fifth year as that representing the period of industrial capacity and for this period has prepared "comparative mortality figures." In the three years referred to there were registered the deaths of 284,009 males between the ages of 25 and 65. Among the professions the clergy showed the lowest mortality; the proportion of them living beyond 65 enormously exceeded the average. Their comparative mortality figure (524) is lower than that of any other occupation except farmers. On the other hand, the medical profession shows a high comparative mortality, 952. Compared with lawyers, doctors die more rapidly at every stage of life. The mortality of publicans (saloon keepers) exceeds the standard at every age, and between 25 and 45 their mortality is more than double the average, but the figures are a distinct improvement on those of previous years. Diseases of the nervous and circulatory systems contribute the largest share to their mortality. The mortality of dangerous occupations shows a decline. Thus among woolen manufacturers, potters, stone quarriers and coal miners there has been a marked decline in the mortality due to phthisis. In lead workers and potters the amount of fatal lead poisoning has been reduced more than 50 per cent.

Deaths Under Anesthetics.

Public attention has been attracted to the number of inquests held recently on patients who have died in London under chloroform and other anesthetics. The home secretary has been asked in parliament whether his attention had been called to the fact that three inquests had been held in one day on persons who had died under anesthetics. In reply Mr. Gladstone said that he was in communication with the lord president of the council, and through him with the general medical council, on the question whether a course of instruction in the administration of anesthetics can be included in all cases in the course of study required for medical qualification.

The Registration of Deaths Bill.

A bill has been introduced into parliament amending the law on the registration of deaths, and is supported by Sir Walter Foster and other medical members. Its object is to give effect to the principal recommendations of the select committee on death certification which sat in 1893. It enacts that any stillborn child born after the twenty-eighth week of pregnancy shall be deemed to have been born alive and to have died after birth. By this legal fiction the registration of deaths is brought into line with that of births under last year's act. It is also proposed that the certificate of death shall be so framed that the physician signing it must have inspected the body, thus abolishing the clause "as I am informed" of the present certificate. The certificate must also specify the signs

from which the fact of death is inferred and state that the certifier has personally attended the deceased on two occasions, one of these two being within eight days of death. The latter modification decides a question—at present difficult—whether an inquest should or should not be held in certain cases of sudden death. The rule is to hold an inquest in all cases in which a person dies without having been attended by a registered medical practitioner. But it frequently happens that a doctor is called in for the first time to a patient who is taken suddenly ill and dies soon afterward. The problem then arises, is the doctor justified in stating on the certificate that he "attended" the deceased in his last illness. This question has never been dogmatically settled as the proposed law will do by making a minimum of two attendances necessary. At present the doctor can, according to his own discretion, give or refuse a certificate. However, some coroners have ruled that seeing a patient only once before death does not constitute "attendance." Another provision is the appointment of public certifiers of death who must be physicians. The functions of these officials will be to verify and countersign the certificate given by a coroner after an inquest. They will thus be medical advisers to the coroners. The public certifier is also to be informed by a registrar when there is doubt about any death or its certification, to inspect the dead body, and to issue a certificate of death if he thinks fit.

Oxygen Inhalations in Athletics.

Mr. Leonard Hill, F.R.S., lecturer on physiology at the London Hospital, has been conducting some remarkable experiments on the use of oxygen in athletics, which he believes will lead to the breaking of records. For the past year, in cooperation with his demonstrator, Mr. Flack, he has been engaged in a research on the cause of hard breathing. He has found that a man can hold his breath for three times the normal period by taking three inhalations of oxygen. Dr. Vernon of Oxford succeeded in holding his breath for eight and one-half minutes. These experiments led Mr. Hill to think that the panting and distress of athletes might be largely mitigated by breathing oxygen deeply before and after a race, the former to prevent distress and to increase running powers, the latter to relieve whatever distress occurs. At the London Hospital athletics oxygen was given to some of the runners immediately after the races and greatly relieved their distress. A well-known athlete, Mr. Holding, ran an unpaced quarter of a mile in fifty seconds after breathing oxygen for three minutes. In the trials for the Olympic games he had been unable to do this in less than fifty-two seconds. The onlookers declared he was not more distressed than if he had run 100 yards, and Mr. Holding agreed with this. There was a notable absence of that stiffness of the muscles and grogginess in the legs which follows a great exertion in running. Another athlete, Mr. Just, after breathing oxygen for three minutes, ran half a mile in one minute and fifty-five seconds, slightly beating his record. Mr. Hill is now trying to get a world's record-breaker to run for him.

Vital Statistics in Edinburgh.

The report of Sir Henry Littlejohn, health officer of Edinburgh, contains much matter of interest. Once more the falling birth rate has touched its lowest figure, 21.68 per 1,000. The death rate also is falling, but whereas the death rate has fallen since 1861 from 23.15 to 14.38—a drop of 60 per cent.—the fall in the birth rate is still greater—from 33.40 to 21.68, about 63 per cent. The falling birth rate is not due to diminution of the number of marriages, for that has slightly increased. It is evidently due to the widespread desire of married people to have a limited number of children.

Are Londoners Poisoned by Coal Gas?

This question is propounded by the *Lancet* in consequence of the report of the largest of the metropolitan gas companies that no less than 110,000,000 of cubic feet of gas had not been accounted for during six months. The loss of this large amount of gas is attributed to leakage in consequence of the increased weight and speed of vehicles since the development of motor traffic disturbing the gas mains. The chairman of the company in making the report was only concerned as to the monetary loss. But the *Lancet* points out that 10 per cent. and probably more of this gas consists of the poisonous carbon monoxid and that it is no wonder when there is no movement in the air and there is a stagnant mist or fog (a time when there is a great demand for gas) Londoners complain of headache, dizziness and oppression—symptoms of chronic carbon monoxid poisoning.

DUBLIN LETTER.

(From Our Regular Correspondent.)

DUBLIN, IRELAND, Aug. 20, 1908.

The University Bill.

During the past few months there have been under debate in Ireland two public matters of much interest to the medical profession, the university bill and the tuberculosis bill. The former has now passed both houses of parliament and only awaits the royal assent to become a law. Under its provisions two new universities are established in Ireland, one in Belfast and one with its center at Dublin, but with constituent colleges in Dublin, Cork and Galway. The college in Dublin is yet to be started, while the Queen's colleges in Belfast, Cork and Galway take their place in the new universities. During the sixty years of their existence the three Queen's colleges have had a varied course. For thirty years they together constituted the Queen's University. Then the university was abolished and for thirty years the colleges have been in the cold, though teaching students for the examining board designated as the "Royal University." Now this board has been abolished and the colleges are arranged in the new combination.

The Tuberculosis Bill.

The tuberculosis bill introduced by the Irish government and designed to give local sanitary authorities additional power to deal with tuberculosis has given rise to a great deal of debate in medical circles. It was drafted apparently without consultation with any competent medical advisers, and at the dictation of the local government board, the government department which has the responsibility for dealing with the public health. This board has distinguished itself even among government departments by its inactivity and incompetence, and as large added powers are proposed to be given to it under the bill, much hostility to certain provisions of the bill has been aroused. The bill itself is, indeed, a very small one, and the principal powers conveyed in it are in the direction of providing sanatoria and isolation hospitals, of inspecting dairies and destroying tuberculous cattle, and of giving instruction in the methods of avoiding tuberculous infection. One clause, however, that rendering it compulsory for the medical attendant to notify the medical officer of health of the district concerning the existence of cases of tuberculosis has called forth a regular tornado of opposition. Curiously enough, it is a reform demanded for years past by all those interested in the tuberculosis question. It is not easy to see any rational ground of opposition to it. The same principle is applied to the case of the other infectious diseases, and has not been found to press unpleasantly on anyone. If the public health authorities are to attempt to deal with tuberculosis at all, it is necessary that they should have some means of learning where the disease is situated. We are likely to hear more about the question in the next month or two, as through pressure of business the bill has had to be postponed till the autumn session of parliament.

Registration of Nurses.

Within the past few days another Irish grievance has come into being, the aggrieved parties being the Irish nurses. For many years past the trained nurses of England, Ireland and Scotland have been agitating for a system of state registration. During the last session of parliament a bill drawn up by the nursing organizations was introduced into the house of lords, and has passed that house, but with the extraordinary amendment added that Ireland should be excluded from its provisions. The amendment was added at the instance of the government, and the Irish nurses, who are clamoring like their English sisters for registration, want to know the reason why. No one can tell them, though there are rumors that the religious orders, in whose hands is much of the nursing in Ireland, are opposed to the principle of registration. The net result is that the bill is likely to be wrecked, and many medical men will not be sorry, since they regard a state-registered nurse as a probable rival in practice.

Death of Sir John Banks.

During the past few weeks Ireland has lost the dean of the medical profession in the person of Sir John Banks, who had reached the age of 97. He had long retired from practice, and some years ago quite lost his sight, but his intellect was clear to the last, and he retained his interest in current affairs. Sir John had been one of the leading figures in Irish medical life for many years while occupying the position of regius professor of medicine in Dublin. He had been president of

the Royal College of Physicians in Ireland, and president of the British Medical Association. It is related of him that on one occasion being offered a knighthood by Queen Victoria, he replied in the following laconic telegram: "No, thanks. John Banks."

BERLIN LETTER.

(From Our Regular Correspondent.)

BERLIN, Aug. 13, 1908.

University Personal News.

The position of teacher of orthopedics left vacant by the death of Hoffa, against the filling of which difficulties were raised on the part of the faculty, as I have mentioned in a previous letter, has now found an occupant. Professor Joachimsthal, a pupil of the renowned Prof. Julius Wolff, who may be mentioned as one of the founders of orthopedic surgery, has been appointed as the successor of Hoffa. Professor Joachimsthal can show some noteworthy accomplishments in his special field. He has the reputation of being a good teacher and successful in practice. To be sure, he does not equal the brilliant personality of Hoffa, and I believe that I am not making too severe a criticism when I assert that he has been chosen because a better man could not be procured.

The various vacancies which have occurred in the chairs of pharmacology in the Prussian universities have also been filled. Privat-docent Dr. Heubner, a son of our regular professor for children's diseases, has been called to Göttingen as the successor of Professor Jacobj, and Gürber, professor of physiologic chemistry, has been called from Würzburg to Marburg as the successor of Professor Heffter (who, as formerly announced, succeeded the deceased Liebreich in Berlin). The change in Gürber's sphere of teaching will not seem striking to you in America, where, as in England, changes in the subjects taught are not uncommon. In Germany, also, it was formerly frequently the case that an anatomist obtained the chair of physiology or of surgery. In late years, however, changes of this sort have scarcely occurred. That such a change was possible in the case of Professor Gürber is to be explained by the fact that pharmacology in the Prussian universities at the present time is treated in somewhat stepmother fashion. The fundamental conditions of pharmacologic instruction have changed so materially in late years that the proper disposition of the subject is unsettled. The discovery of new remedies is a rare occurrence in our university pharmacologic institutes; this work is carried on in the laboratories of the great manufacturing chemists in which scientific chemists are working continually with great success in the development of synthetic chemistry, pharmacology and pharmacy. The important remedies which have been discovered of late, viz., veronal, sajodin, aspirin, etc., etc., originated in the great factories, such as the Elberfeld color works, the Höchst color works, Merck's factory at Darmstadt, etc. The university pharmacologic institutes confine themselves, as a rule, to testing these products after their introduction. But as these institutes have no clinical material available the testing can extend only to animal experiments. The clinical trial of the new medicines naturally takes place in the clinics and hospitals, and this field of study is lacking in the pharmacologic instruction. There remains for it only the art of prescription writing, and this task does not seem a sufficient basis for a special chair of pharmacology. What I have set forth here is the opinion of many clinicians who, for this reason, have come to the conclusion that instruction in pharmacology should be attached to clinical medicine. That the pharmacologists, on the other hand, object to this is easily understood. I refer in this connection in particular to an article which Prof. Hans Horst Meyer, of Vienna, a pharmacologist very prominent at the present time, published in one of the latest numbers of the *Deutsche med. Wochenschrift*. But it appears, as noted above, that with the Prussian authorities the trend of opinion is in a direction unfavorable to pharmacology. This is well illustrated by the fact that when the noted pharmacologist, Professor Binz, at Bonn, resigned his chair a short time ago on account of age, a pharmacologist was not appointed to succeed him, but the professor of internal medicine, Professor Leo, although Leo's achievements in the pharmacologic field are quite unimportant.

Moreover, Prof. George Klemperer, who is at present a privat-docent of special pathology and therapeutics at Berlin, has been selected by the government as the successor of Professor Leo. The Bonn medical faculty are not, however, satisfied with this selection, and for several months negotiations have been in progress regarding this question. The government has, of course, the right to fill the place without reference to the wishes of the faculty, but in this case it may well hesitate to do so, as not long ago it transferred a professor from the Bonn faculty against their expressed wish, and the repetition of the proceeding might lead to a conflict with the professors at Bonn. Whether a harmonious conclusion will be reached remains to be seen. Certainly the Bonn faculty would gain an excellent teacher in George Klemperer.

Professor Ewald, the well-known author in the field of gastrointestinal pathology, has been appointed an ordinary honorary professor on a regular salary (*ordentlicher-Honorar-Professor*). This peculiar position is best characterized by the humorous definition: An "ordinary honorary" professor is a professor who is not an *Ordinarius* and who receives no *Honorare* (fees). Regular (*ordentliche*) professors are those who have a seat and a vote in the faculty. The "ordinary honorary" professors do not belong to the voting body of the faculty, but have a salary and this honorary title. At any rate, it signifies a distinction which the prominent clinician has well deserved. At present we have in Berlin 11 "ordinary honorary" professors, considerably more than in former years.

Of late in Germany, and especially in Prussia, it has become the custom on the part of the government to grant titles and orders in greater numbers and more readily than formerly, and the medical profession comes in for its share as well. That the distinctions lose in value with their greater frequency is beyond question.

VIENNA LETTER.

(From Our Regular Correspondent.)

VIENNA, AUSTRIA, Aug. 18, 1908.

Postgraduate Work in Vienna.

I wish to express my heartiest endorsement of your editorial in the issue of July 25 on "Medical Work in Vienna." The man who wrote it shows a very good insight into conditions as they are now here. Indeed, lately the number of men who wanted to obtain all the best of medical knowledge for no money and no time had increased to such a degree that they were really handicapping those who were intent on earnest work. I hope that the editorial will be read by all those who intend coming to Vienna.

The New Clinics in Vienna.

To-day the foundations of the three new clinics in the new General Hospital have been laid. The new buildings will not be handed over to the university before 1910. The first is to be a clinic for internal medical cases (Professor von Noorden) with 100 beds, an isolation pavilion, a diet kitchen for special diet in diseases of metabolism, and a special laboratory; the second a clinic for diseases of the nose and throat (Professor Chiari) with 48 beds, an isolation pavilion of 10 beds for diphtheria cases, all necessary annexes, an operating theater and a laboratory; and the third a clinic for diseases of children (Professor von Escherich), which will have 44 beds, an infant ward with 10 cots, and a *couveuse*, or incubator ward, with 72 boxes, for premature or very delicate babies. In separate pavilions will be wards for scarlet fever (24 beds), and diphtheria (21 beds). The lecture hall, where the professors will deliver their lectures, will seat 236 students in the medical clinic, 200 in the pediatric, and 100 in the laryngologic clinic.

The expenditure for these three clinics has been estimated at 5,000,000 crowns (about $1,000,000) apart from the cost of the site. The price of the ground will be more than covered by the proceeds of the sale of the old general hospital.

The two gynecologic and obstetric clinics (Professors Schauta and von Rosthorn) are already in working order. Each contains 200 beds, with 35 reserve beds, for obstetric cases, and 52 beds, with 6 reserve beds, for gynecologic cases. There is also a pavilion for 24 infectious cases. All the nurses, the members of the medical staff, and the students practicing their fortnight's *practicum* (the two weeks' service as junior assistant which each student must give at least twice), are lodged within the clinic. The lecture hall will accommodate 200 students. Apparatus for instruction, laboratories and kitchens are provided on a liberal scale. A third obstetric clinic, for the instruction of midwives only, will soon be opened. The expenditure for these three clinics, which is met by the state, also amounts to a million dollars. The new pavilions are only 200 yards away from the old *Allgemeines Krankenhaus* or general hospital, well known to all students, and will enjoy better air and greater quiet, thanks to the closer vicinity of an extensive park and the greater distance from public traffic.

Pharmacology

[CONTRIBUTION FROM THE LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION.]

SODIUM PERBORATE.

W. A. PUCKNER AND H. A. CLARK.

A chemical compound known as sodium perborate has been put on the market in the last few years and its use proposed in both medicine and the arts. Its therapeutic and technical value depends on its property of forming hydrogen dioxid when brought in contact with water, and it has been proposed as a substitute for hydrogen dioxid solution (Aqua hydrogenii dioxidi, U. S. P.). The advantages claimed for it over the well-known "peroxid" are those of stability, uniformity, convenience, greater oxidizing power and decreased cost. Thus, it is stated that while "hydrogen peroxid preparations are subject to deterioration and loss in strength when once the bottle is unsealed" sodium perborate "will keep and stand transportation in its concentrated powder form and always be ready for solutions of hydrogen dioxid of any desired strength, whereas the bulky hydrogen peroxid 10 volume solution has to be diluted for use in most cases and keeps you always uncertain of its real strength." Another advantage claimed for sodium perborate is that its solutions in water are alkaline, while the available medicinal hydrogen peroxid solutions are always acid.[1]

Since it appeared that sodium perborate might possess some real advantages over hydrogen dioxid the Council on Pharmacy and Chemistry took up the examination of the product as found in the American market with a view to including it in the New and Non-Official Remedies. In this country sodium perborate is advertised and sold chiefly by the Roessler & Hasslacher Chemical Company, New York, and the firm claims that the preparation contains from 9 to 10 per cent. of available oxygen. Samples of sodium perborate were obtained both direct from the firm and also in the open market. When assayed by the method given below[2] they were found to contain, not from 9 to 10 per cent. of available oxygen as stated on the label, but from 6.54 to 7.66 per cent., as is shown in the account of the examination given in detail below.

The above report was submitted to the Council on Pharmacy and Chemistry. The council having directed publication of the report, it was sent to the Roessler & Hasslacher Chemical Company prior to publication. The reply of the firm was submitted to the Council by a subcommittee, with the following report:

In accordance with the general procedure followed by the Council, the report of the chemical laboratory as adopted by the Council and ordered published was submitted to the manufacturer. In repiy the manufacturer states that the firm is now conducting experiments to overcome the defects found. Your committee regrets that the manufacturer does not agree to withdraw the false claims made for the product until the product possesses the strength claimed. It is understood that the Council will gladly reinvestigate the product any time that the firm believes that their experimentations have led to a successful issue and the product as found on the market complies with the rules. In the meantime your committee recommends that the report be published so that physicians may be informed of the truth and not be misled by the claims of the manufacturer which may in the future be trustworthy but certainly are not so at present.

This report was adopted.

W. A. PUCKNER, Secretary.

1. The chemical formula assigned to sodium perborate is $NaBO_3+4H_2O$. While sodium meta-borate $NaBO_2$ has the constitutional formula BO(ONa) and is derived from BO(OH) sodium perborate $NaBO_3$ has the constitutional formula BO(OONa) and is derived from BO(OOH). When sodium perborate is treated with water hydrolysis occurs, thus: $NaBO_3+H_2O = NaBO_2 + H_2O_2$; the sodium meta-borate so formed gradually absorbs water to form borax and sodium hydroxid, thus: $4NaBO_2 + H_2O = Na_2B_4O_7 + 2NaOH$. From this, it appears that sodium perborate when dissolved in water reacts to a certain extent to form hydrogen dioxid, borax and sodium hydroxid; if acid is added to neutralize the sodium hydroxid then the reaction goes on to completion, and all the sodium perborate is decomposed into hydrogen dioxid. Assuming that every molecule of sodium perborate $NaBO_3 \cdot 4H_2O$ yields one molecule of hydrogen dioxid, which, in turn, contains one atom of available oxygen, then every 152.94 gm. sodium perborate should yield 15.88 gm. of available oxygen.

2. SPECIMEN 1.—Three one-quarter pound packages (designated A, B and C) received at the chemical laboratory of the American Medical Association direct from the manufacturer, in July, 1907. Package A was assayed at that time and found to contain 6.79 per cent. available oxygen. Package B was left in its original condition, and package C was transferred to a glass stoppered bottle. On June 3, 1908, packages A and B each assayed 7.14 per cent. available oxygen, while package C (the one kept in the glass stoppered bottle) assayed 5.29 per cent. available oxygen.

SPECIMEN 2.—Three one-quarter pound packages (designated A, B and C), received at the chemical laboratory of the American Medical Association direct from the manufacturer Aug. 23, 1907. Packages A and C were not opened when received. Package B was opened and examined at once. The contents were found to weigh 140 gm. It assayed 7.66 per cent. available oxygen. On June 6, 1908, the contents of this package weighed 115.5 gm. and assayed 7.32 per cent. available oxygen. Package A was opened and found to assay 7.2 per cent. available oxygen. Package C is still retained in its original condition.

SPECIMEN 3.—A one-quarter pound package purchased in the open market in Chicago, Aug. 24, 1907. The contents of the package weighed 130 gm. on date of purchase and assayed 6.59 per cent. available oxygen. On June 3, 1908, the contents of this package weighed 106 gm. and assayed 7.34 per cent. available oxygen.

SPECIMEN 4.—A one-quarter pound package purchased from the Chicago Branch of the Roessler & Hasslacher Chemical Co., May 13, 1908. On the date of purchase this specimen assayed 6.54 per cent. available oxygen.

SPECIMEN 5.—A one-quarter pound package purchased in the open market in Chicago on April 21, 1908. On date of purchase this specimen assayed 6.74 per cent. available oxygen. On June 3, 1908, this specimen assayed 6.26 per cent. available oxygen.

The above examination reveals two important facts regarding this substance. In the first place it is not of the strength indicated on the label; in the second place the product seems to be decidedly unstable and unreliable. Specimen 1, in the eleven months intervening between the two assays, increased in strength. The weight of this sample was not ascertained at the time of purchase. Specimen 2 lost by keeping, approximately 17.5 per cent. in weight. If this loss is due to the loss of moisture or water of hydration only, a corresponding increase in available oxygen should be noted. In other words the specimen should have assayed at this time something over 9. per cent. available oxygen. Instead approximately 4 per cent. of the amount of available oxygen originally present had disappeared, showing that the actual loss of available oxygen was about 26 per cent. of that originally present. Specimen 3 lost approximately 18 per cent. in weight. Again, if this loss was due to water only, the specimen should have assayed approximately 8 per cent. available oxygen. This indicates an actual loss in available oxygen of approximately 10 per cent. of that originally present.

METHOD EMPLOYED.—The following method was used to determine the available oxygen content in sodium perborate: A weighed quantity of the salt was placed in a dry flask and about 200 c.c. of water added. To this was added 10 c.c. dilute sulphuric acid and titration with potassium permanganate solution at once begun. A few of the earlier estimations were checked by the method proposed in Merck's *Prüfungsvorschriften für die pharmazeutischen Spezial-Präparate*, as follows: To a weighed quantity of sodium perborate about 1 gm. was placed in 100 c.c. volumetric flask and treated with 50 c.c. water. To this 10 c.c. of dilute sulphuric acid were added and solution hastened by moderate agitation. Potassium iodid, 5 gm., dissolved in 25 c.c. of water were added and the mixture allowed to stand with frequent agitation during one-half hour. Sufficient water to make the liquid measure 100 c.c. was then added and portions of 10 c.c. titrated with tenth-normal sodium thiosulphate solution.

The results above given were transmitted to the manufacturers. In their reply the manufacturers did not claim that the product sold by them contained from 9 to 10 per cent. available oxygen, but nevertheless appeared to consider it their privilege to sell it under this claim. While not claiming that the product really contained 9 to 10 per cent. available oxygen, they did express surprise at the low results obtained in this laboratory and, as was but natural, suggested that probably the method of assay used by us was faulty and did not do their product justice. Thus, they suggested, that there is danger that some oxygen may be liberated from the solution before the titration is made. They suggested that the liquid should not be heated in order to produce a quicker solution and that the sulphuric acid should only be added after all the perborate has dissolved. To determine whether complete solution of perborate before titration is essential, the following experiments were made:

1. Sodium perborate was treated with water having a temperature of 9 C. (48.2 F.); the dilute sulphuric acid was added before complete solution and titration with permanganate begun at once. Result, 7.89 per cent. available oxygen.

2. The conditions of the experiment were as in (a), except that the water had a temperature of 35 C. (95 F.). Result, 7.76 per cent. available oxygen.

3. The water had, and was kept at, a temperature of 9 C. (48.2 F.); the acid was added only after complete solution had occurred (this required 30 minutes), and the titration then begun. Result, 7.58 per cent. available oxygen.

4. The water had a temperature of 35 C. (95 F.). The acid was added after complete solution had occurred (4 minutes), and titration then begun. Result, 7.59 per cent. available oxygen.

These experiments show that the method of titrating sodium perborate as used in our experiments did not entail loss of oxygen prior to the titration.

Exposure of Fraudulent Proprietaries in Germany.

The need of an unbiased scientific examination of all medicines of a proprietary nature, instead of reliance on the manufacturer's claims for information regarding them, is becoming

generally recognized. In Germany the recent exposure of the products of Dr. A. Horowitz—Arbovin,[1] Pyrenol,[2] Visvit[3] and Iodofan[4]—by Professor Thoms, F. Zernik and others has done much to show that some method of controlling such products is needed to protect physicians from fraud.

At the annual meeting of the Association of German Chemists (Verein deutscher Chemiker), recently held in Jena, Germany, the necessity for an official board or institute to analyze and pass judgment on proprietary medicines was again emphasized.

A paper was read in which it was held that only an official bureau would be in a position to impart information in regard to the character of such preparations, whether misleading statements were being made about it, and whether the product is dangerous to the public health or deficient in therapeutic properties. The warnings issued by the Berlin police, the Carlsruhe Board of Health and the Pharmaceutic Institute of the University of Berlin have generally blown past like an idle wind, leaving no permanent effect, except that those who exposed the fraud were usually put to much inconvenience and annoyance. The author of the paper stated that he was threatened with a damage suit when, ten years ago, he called attention to the chemically incorrectly designated mixture sailing under a scientific flag, Glycosolvol, one of the first representatives of the now ubiquitous fake synthetics.

Lately, he continued, the director of the Pharmaceutic Institute of Berlin University—Professor Thoms—had to appear in court on account of his exposure of Pyrenol. He commented on the audacity of the manufacturers of fraudulent products who try to frighten their adversaries by arrogant impudence; he instances the fact that the manufacturer of Pyrenol twisted, into advertisements of his remedy, the exposures of it made by Thoms, Zernik and Gadamer. While physicians are the ones who are directly humbugged, in Germany the medical profession seems to be the least concerned about the matter if we are to judge by our German exchanges.

Correspondence

Contract Practice.

JOHNSTOWN, N. Y., Aug. 3, 1908.

To the Editor:—In the Department of Medical Economics, in THE JOURNAL, Aug. 1, 1908, page 425, you state substantially that there is ethically or legally no reason why a physician should not make a contract with lodges, provided he be paid proper prices for his services.

I believe that there is a view of "lodge doctoring" you entirely overlook, and to my mind it is the most important.

As soon as a physician assumes the position of "lodge physician" immediately every member of that lodge becomes an active canvasser for new recruits not alone for their lodge, but to his clientele. They invade the fields of every physician and prevail on their patients to become members of their beneficial society (really Dr. So-and-So's free medical clinic), as the greatest benefit to be derived is the valuable boon of free (?) medical services.

In my opinion, price has nothing to do with it; it is the unfair competition that is and should be the most objectionable feature. I believe it is incorrect, ethically, for any physician to occupy the position of "club physician," regardless of price.

Perhaps it may be all right if every doctor should institute his free medical clinic, "price $1.50 a year, in advance," but is it a desirable state for the profession to attain.

AUSTIN HOGAN.

1. THE JOURNAL A. M. A., May 9, 1908, p. 1541.
2. THE JOURNAL A. M. A., June 13, 1908, p. 1995.
3. THE JOURNAL A. M. A., May 2, 1908, p. 1440.
4. THE JOURNAL A. M. A., March 7, 1908, p. 784, and April 4, 1908, p. 1135.

Miscellany

ASSOCIATION OF NATIONAL FOOD AND DAIRY DEPARTMENTS.

The twelfth annual convention of the Association of State and National Food and Dairy Departments, held at Mackinac Island, Mich., August 4-6, was one of the most important conferences in the history of the movement for pure foods.

In his opening address as president, Hon. E. F. Ladd, of the North Dakota Agricultural College, reviewed the history of the movement and discussed the relation of national legislation to that of the various states. He reviewed in detail the work of the Department of Agriculture and severely criticised the attitude of Secretary of Agriculture Wilson. After quoting President Roosevelt that the action of the various state food and dairy commissioners showed how much good for the whole people resulted from the cooperation of the federal and state officials, President Ladd said that much could be accomplished with a national law left for its enforcement to an unhampered, liberal minded and fearless man like Dr. Harvey W. Wiley. "Then food adulterators and special interests would respect and obey the laws, but when there stand between him and the 'interests' a specially constituted board of doubtful constitutionality, how can we hope for cooperation such as the President calls for? We should not, however, forget the good work that the secretary has done for the cause of agriculture, but should direct our criticisms to the workings under the food law, where, no doubt, enormous political pressure has been brought to bear. . . . it has been recognized that the common ground on which state and national laws can best meet is through the establishment of proper standards which would serve as a guide for both state and national authorities, prove an aid to the courts and enable honest manufacturers to meet the demands of the several food laws. But the establishment of standards is what the food adulterators and special interests fight against, for, with established standards once in force the food adulterator's days are numbered; the honest producer comes to his own and the people receive what they order and pay for."

He then reviewed the efforts made to secure such standards and stated that the Secretary of Agriculture did not favor their establishment. He concluded his address by saying that as a result of a year's experience it must be concluded that there could be no official cooperation between state and national authorities in the preparation of standards as a common basis for action and that special attention should be given to strengthening state laws and enlarging the standard committee and continuing the preparation of standards already begun, which standards should be made a part of the statutes in every state.

Professor Ladd specifically recommended the appointment of a committee to draft a uniform law for adoption by the various states and also made a number of technical recommendations regarding preservatives, bleached flour, etc. As a result of this address the convention adopted resolutions setting forth its views as follows:

Resolved, That the Association of State and National Food and Dairy Departments again reaffirms his allegiance to the principles of uniformity of food laws. This association has worked faithfully and consistently towards securing such uniformity, both of requirements and interpretation, as will secure to the consuming public of every State alike, ample and sufficient protection from fraud in and adulteration of food products. In support of this policy this association welcomed the cooperation of The National Government as manifested through the Department of Agriculture in making provision for the work of the joint standards committee. We believed then, and we believe now, that only through the determinations of such a committee can satisfactory foundation be laid for a uniform law.

This association regrets that such cooperation has been withdrawn by the Secretary of Agriculture, and it is with extreme reluctance that, after more than a year's delay, a year spent in fruitless effort to again enlist the support and cooperation which the Department of Agriculture previously volunteered, we are at this time forced to the conclusion that the work of the joint standards committee, if continued, must be provided for and sustained without assistance from the National Government. The following facts have led to this conclusion:

First: The Secretary of Agriculture was authorized by Congress to provide for the joint standards committee.

Second: Under this authorization the support of the National Government was at first freely tendered and results eminently satisfactory were secured.

Third: The Secretary of Agriculture, through his accredited representative, Dr. Galloway, stated before the Senate Committee

on Agriculture that direct authorization of further expenditures for continuing the work of the joint standards committee was entirely unnecessary because of the fact that under the National Food and Drugs Act the Secretary of Agriculture has ample authority for making expenditures to continue this work. Authority for this statement is to be found in the printed records of the proceedings of the Senate Committee on Agriculture. Accepting such statement in good faith, the friends of a vigorous administration of the food law withdrew their demands for said direct appropriation.

Fourth: From that time to the present the Secretary of Agriculture has not again called the joint standards committee together.

Fifth: Because of the failure of the Secretary of Agriculture to again call together the joint standards committee, this association, at its annual convention of 1907, by formal resolution, requested the Secretary of Agriculture to again aid and assist in the further continuance of the work of said joint standards committee.

Sixth: This resolution was promptly transmitted to the Secretary of Agriculture by the secretary of this association, but no reply has ever been received thereto.

Seventh: The Secretary of Agriculture was appealed to in person by four members of the executive committee of this association in November, 1907, and at the close of said conference stated as his definite and final conclusion that he had no power to use any of the funds appropriated by Congress for the administration of food and drug work in paying the expenses of the joint standards committee.

Eighth: When confronted by the written record of the report of the proceedings of the Senate Committee on Agriculture, in which his statement, through Dr. Galloway, is recorded, the Secretary of Agriculture did not deny his responsibility therefor.

Ninth: As a last resort the executive committee of this association, as represented at that conference, tendered the services of the joint standards committee free from expense to the Secretary of Agriculture. The reply of the Secretary of Agriculture was directly to the effect that it would not be legal for the National Government to accept services for which it did not pay.

Tenth: Several months later the Secretary of Agriculture, when requested to call together representatives of the food departments of the several states in order that a proper appeal might be made to Congress for a direct appropriation to continue the work of the joint standards committee, refused to take such action.

However, regardless of these unfortunate conditions, this association believes that the work of the joint standards committee must be continued, and hereby authorizes its continuance, and pledges its good faith that ways and means will be provided for the maintenance of said committee.

This association further pledges its every effort to formulate, within the coming year, a food bill founded upon the determinations of the joint standards committee, which food bill shall be formulated with a view towards uniform requirements throughout the several States.

This association also pledges its best services toward securing effective cooperation between the food departments of the several states in their efforts towards the securing of such uniformity.

Resolved, That this association hereby authorizes and directs the present president of the association to appoint a committee of seven, of which he shall be the chairman, to prepare a model state food bill, the determinations of the joint standards committee to be used as a basis of facts in the preparation of said bill.

Resolved, That this association is unalterably opposed to the bleaching of flour by the oxides of nitrogen or other chemicals.

Resolved, That this association is convinced that all chemical preservatives are harmful in foods and that all kinds of food products are and may be prepared and distributed without them, and pledges its best efforts to use all moral and legal means at its disposal to exclude chemical preservatives from food products, and to this end, we ask the cordial support of all national, state and municipal authorities charged with the enforcement of food and drug laws. And in this connection we desire to express our gratitude for the helpful services of the medical profession generally, and especially to the American Medical Association.

COMMENTS.

The appointment of a committee to draft a uniform law for the various states is of the utmost interest and importance to all physicians. It is hoped that arrangements may be made for cooperation between this committee and the Committee on Medical Legislation of the American Medical Association whereby such a bill may be endorsed by the Committee on Medical Legislation and its adoption advocated by physicians throughout the country. Laws adopted by the federal government can affect only articles of interstate commerce. The real regulation of foodstuffs must eventually rest with the various states. Uniform and effective state legislation is, therefore, of the greatest importance.

The association adopted a standard for distilled spirits, which was prepared after careful scientific investigation by the joint food standard commission appointed by the association and by the Association of Agricultural Chemists. This standard is in accord with the order issued by President Roosevelt based on the opinion of Attorney-General Bonaparte as to what constitutes straight and blended whiskies.

OFFICERS ELECTED.

Prof. J. Q. Emery of Wisconsin was elected president, and Mr. R. M. Allen of Lexington, Ky., was re-elected secretary. Mr. Allen came into well-deserved prominence last winter as one of the promoters of the Kentucky Pure Food Law, which was abstracted in THE JOURNAL, March 21, 1908, page 985. He has recently resigned his position on the pure food commission of Kentucky and is now an assistant attorney-general of the United States under Mr. Bonaparte, in special charge of the prosecutions of violations of the pure food law.

Headache and Eyestrain.—L. H. Mettler, Chicago, in the *Medical Herald*, August, discusses the relationship of the psychoneuroses, especially headache, to eyestrain. He asserts that eyestrain never produces headache in the absence of a congenital or acquired abnormality of the nervous system, and that when there is an abnormal condition of the nervous system present—an abnormality which in itself may account for the headache—the ocular, like other anomalies, may and sometimes does provoke such a nervous apparatus into a distressing degree of indefinite activity along sensory, motor and other functional lines. In upholding these two propositions Mettler appeals to logic, physiology and clinical observation. He says that much of the argument in favor of the headache and the other neuroses being caused by an excess of a physiologic function in an otherwise normal organism is of little real scientific value. In most cases the same sort of reasoning would enable one to fix on other equally probable causes for the cephalalgia. In his appeal to physiology, which clinical medicine seems so often and so strangely to ignore, he quoted many fundamental maxims to show how the great law of habituation and accommodations nullifies the assumed deleterious effects of mere excess of function in an otherwise normal nervous system. In his argument from the clinical side he pointed out the curious and suspicious fact that it is only in the functional and little pathologically known psychoneuroses that these eyestrains play so important a rôle. One would imagine that now and then so persistent and supposedly effective a course ought to produce an organic trouble; but it never does. In no known organic nervous trouble is eyestrain invoked as a cause. He furthermore showed that it is incomprehensible how in an otherwise normal organism visual anomalies and muscular imbalance can originate such well-established and distinct clinical entities as migraine, epilepsy, chorea or hysteria. A uniform cause is always followed by a uniform result. This is a fundamental axiom of science. He asserted that it is in cloud land of ancient pathology and symptomatic medicine, both of which ignore the plain teachings of modern physiology and physiopathology, that the belief that eyestrain is and can be "the sole and sufficient cause of headache" and other psychoneuroses, flourishes.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish name or address will be faithfully observed.

VALUE AND TECHNIC OF MERCURIAL INJECTIONS.

To the Editor:—I would like an opinion as to the value of mercurial injections; where to inject, and how often, how to prepare the injection, and what form to use. H. F.

ANSWER.—Mercurial injections are of undoubted value, since they possess all the advantages of hypodermic treatment as well as giving more prompt results than are secured by medication by the mouth. The technic is the same as in any deep intramuscular injection. A needle, preferably of platinum, of one and one-half inches in length, should be used. The injections are usually made into the deep substance of the gluteal muscles, the needle being introduced at right angles to the surface and forced directly into the muscular tissue. The usual dose is from 5 to 30 minims—depending on what solution is used—at an injection. Of the many mercurial preparations which have been used for this purpose, mercury salicylate and mercury sozoiodolate (the salt of diiodo-paraphenolsulphonic acid) have received much favorable comment. The solution of the sozoiodolate may be prepared by triturating one gram mercury sozoiodolate, Merck, with water, 50 c.c. and adding to this a solution of sodium iodid, 3 grams, in water, 50 c.c. The solution should be filtered. For prescription of mercury salicylate, see THE JOURNAL, July 27, 1907, p. 339. Injections can be given on alternate days or every day for a period of from two to four weeks, depending on the condition of the

patient and the necessity of obtaining immediate results. After giving the injections for from two to four weeks, it is well to suspend treatment for about the same length of time, later resuming it if necessary. During the hypodermatic treatment, iodids can be given by the mouth in the usual way, if desired.

The following articles that have appeared in THE JOURNAL may be referred to:

Gotthelf, W. S.: Ten Years Experience in the Treatment of Syphilis by the Intramuscular Injection of Insoluble Mercurials, Aug. 3, 1907, p. 365.

Lydston, G. F.: Intravenous Treatment of Syphilis, Nov. 16, 1907, p. 1662.

Therapeutics: Injection Treatment of Syphilis, July 27, 1907, p. 339.

Wernigk, R.: Twelve Years Experience in Treatment of Syphilis by Intravenous Injections of Mercury, Arsenic and Iodid of Sodium, Feb. 1908, p. 609.

KEPHIR AND KOUMYS.

PITTSBURG, PA., Aug. 20, 1908.

To the Editor:—How is kephir prepared? What is meant by "mother kephir" and how is it obtained? H. C. FELDSTEIN.

ANSWER.—According to most authors the product of the natural fermentation of mare's milk is called koumys. This fermentation is produced by a peculiar fungus which occurs in masses, called by the Tartars kephir seed or the millet of the Prophet. The imitation product, prepared from cow's milk, is known as kephir. Kephir is prepared by adding the fungus to the milk and keeping it at a temperature below 50 degrees F. During the process of fermentation the bottle should be shaken at least once a day, in order that the part which coagulates may not be unevenly distributed throughout the mass. Kephir is usually distinguished as two-day and three-day kephir. The former contains more milk sugar and less lactic acid than the latter. "Mother kephir" is a term applied to the fungus. The dry fungus is on the market as a non-proprietary article which can be obtained through wholesale druggists. Much of the koumys that is made in this country is produced by adding sugar to milk and fermenting with yeast.

BISMUTH PASTE TREATMENT OF TUBERCULAR SINUSES.

GREEN ISLE, MINN., Aug. 25, 1908.

To the Editor:—In what numbers of THE JOURNAL can I find literature on the bismuth paste treatment of tubercular sinuses? Any other additional references will be welcome.

J. P. SCHNEIDER.

ANSWER.—This treatment was described by Dr. E. G. Beck, Chicago, in THE JOURNAL, March 14, 1908, page 869, and in the *Illinois Medical Journal*, April and July, 1908. There was also a discussion of the matter in a society report in THE JOURNAL, July 25, 1908, page 342.

THE FOLIN METHOD OF ESTIMATING THE QUANTITY OF AMMONIA IN THE URINE.

In THE JOURNAL, Aug. 22, 1908, page 692, was a correction of the article by Dr. W. H. Buhlig in a previous issue of THE JOURNAL. An error unfortunately occurred in this correction. This error was detected, however, after a few copies had been run off, so that about 95 per cent. of the edition was correct. The first legend should be as follows:

Fig. 1.—Apparatus used in the Folin method of determining the ammonia content of urine, with the addition of an air-filled flask. C: A, dilute H_2SO_4; B, 50 c.c. urine, 20 gm. NaCl, 20 c.c. petroleum, 2 gm. Na_2CO_3, added last; C, air flask; D, 30 c.c. n/5 H_2SO_4 + distilled H_2O.

The Public Service

Army Changes.

Memorandum of changes of stations and duties of medical officers, U. S. Army, for the week ending Aug. 29, 1908:

Bloombergh, H. D., capt., M. C., granted twenty days' leave to take effect about Oct. 5, 1908.

Field, Peter C., capt., M. C., ordered to proceed to Fort Benjamin Harrison, Ind., for duty during the maneuvers.

Griffs, Frank C., first lieut., M. R. C., ordered for duty at camp of instruction, Fort Benjamin Harrison, Ind., revoked.

Henning, O. F., first lieut., M. R. C., ordered to accompany the command at Fort Sheridan, Ill., to camp of instruction, Fort Benjamin Harrison, Ind.

Halliday, Francis A., first lieut., M. R. C., ordered to report in person to Colonel Valery Havard, Medical Corps, president of the board of officers appointed to meet at the Army Medical Museum Building, Washington, D. C., for examination, to determine his fitness for appointment as first lieutenant in the Medical Corps of the Army.

Hasseltine, H. E., first lieut., M. R. C., granted two months' leave of absence.

Whiteley, Joseph H., contract surgeon, granted eighteen days' leave of absence.

Kirkpatrick, Thomas J., major, M. C., leave of absence extended fourteen days.

Blanchard, R. M., capt., M. C., leave of absence extended one month.

Snoddy, Cary A., capt., M. C., honorably discharged from the service of the United States.

Brown, O. G., capt., M. C., granted ten days' leave of absence.

Weed, Frank W., capt., M. C., granted leave of absence for thirty days.

Dowd, Pascal M., contract surgeon, ordered to proceed from Fort Ontario, N. Y., to his home, Oswego, N. Y., and report to the Surgeon-General of the Army for annulment of contract.

McCown, Thomas B., first lieut., M. R. C., assigned to active duty at his present station.

Shortlidge, E. D., capt., M. C., resignation of his commission as a medical officer of the army has been accepted by the President, to take effect Sept. 15, 1908.

Baker, Charles L., first lieut., M. R. C., recently appointed from contract surgeon, with rank from July 7, 1908, is ordered to active duty in the service of the United States, and assigned to duty at his present station.

Tyler, George Trotter, first lieut., M. R. C., ordered to proceed from Fort Monroe, Va., to Fort Fremont, S. C., for temporary duty.

Bloombergh, H. D., capt., M. C., granted twenty days' leave of absence.

Navy Changes.

Changes in the Medical Corps of the U. S. Navy, for the week ending Aug. 29, 1908:

Hoen, W. S., P. A. surgeon, ordered to duty with flotilla of lighthouse vessels en route to Pacific coast.

McClurg, W. A., medical director, detached from duty as a member of the naval examining and naval medical examining boards, Washington, D. C., Sept. 1, and ordered home.

Brown, E. M., surgeon, unexpired portion of sick leave revoked; ordered to the naval recruiting station, Los Angeles, Cal.

Duhigg, J. T., asst.-surgeon, detached from the naval recruiting station, Los Angeles, Cal., and ordered to duty with the Pacific Torpedo Fleet.

Hathaway, G. S., asst.-surgeon, detached from the naval hospital, Boston, Mass., and ordered to Washington, D. C., Sept. 1, for examination for promotion, and then to wait orders.

Biello, J. A., asst.-surgeon, detached from duty with the Pacific Torpedo Fleet, and ordered to the naval hospital, Mare Island, Cal.

Steele, J. M., medical inspector, detached from the navy yard, Portsmouth, N. H., September 18, and ordered home.

Murphy, J. A., surgeon, detached from the *Dolphin* and ordered home to wait orders.

McLean, N. T., P. A. surgeon, unexpired portion of leave revoked; detached from the naval station in New Orleans, La., and ordered to the *Dolphin*.

Bunker, C. W. O., asst.-surgeon, detached from the *Arkansas* and ordered to the *Montgomery*.

Sellers, F. E., asst.-surgeon, detached from the *Nevada* and ordered to the *Texas* when commissioned.

Brooke, F. H., asst.-surgeon, detached from the *Montgomery* and ordered to the naval hospital, Boston, Mass.

Lane, H. H., asst.-surgeon, detached from duty in the department of government and sanitation, Isthmian Canal Zone, Panama, and ordered to course of instruction at the naval medical school, Washington, D. C., October 1.

Turner, H. W. B., asst.-surgeon, ordered to the naval medical school hospital, Washington, D. C., for duty.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon-General, Public Health and Marine-Hospital Service, during the week ended Aug. 28, 1908:

SMALLPOX—UNITED STATES.

California: San Bernadino, Dec. 11-July 11, 54 cases; 11 cases previously reported; San Francisco, Aug. 9-15, 6 cases.
Indiana: Indianapolis, Aug. 10-16, 3 cases; South Bend, Aug. 9-15, 1 case.
Kansas: Topeka, Aug. 2-15, 2 cases.
Missouri: St. Joseph, July 25-Aug. 1, 4 cases.
North Carolina: Charlotte, Aug. 9-15, 1 case.
Wisconsin: LaCrosse, Aug. 9-15, 7 cases.

SMALLPOX—FOREIGN.

Arabia: Aden, July 21-27, 7 deaths.
British South Africa: East London, July 12-18, 5 cases.
Great Britain: Liverpool, Aug. 2-8, 2 cases.
Ceylon: Colombo, July 5-11, 7 cases, 2 deaths.
China: Hongkong, July 5-11, 2 cases, 2 deaths.
Egypt: Cairo, July 22-29, 3 cases, 1 death; Suez, June 25-Aug. 1, 1 case.
France: Marseilles, July 1-31, 1 death; Paris, July 25-Aug. 1, 1 case.
India: Bombay, July 15-21, 18 deaths; Calcutta, July 5-11, 7 deaths.
Italy: General, July 26-Aug. 2, 118 cases; Naples, July 19-Aug. 1, 20 cases.
Japan: Osaka, July 19-25, 1 case.
Java: Batavia, July 5-11, 3 cases.
Netherlands, The: Amsterdam, Aug. 1, 1 case.
Philippine Islands: Manila, June 31-Aug. 4, 17 cases, 10 deaths.
Portugal: Lisbon, July 26-Aug. 8, 6 cases.
Russia: Moscow, July 19-25, 13 cases, 1 death; Riga, July 25-Aug. 1, 1 case; St. Petersburg, July 19-25, 32 cases, 3 deaths; Warsaw, June 6-27, 14 deaths.
Siberia: Vladivostock, June 15-21, 3 cases.
Spain: Malaga, March 1-April 30, 4 deaths; Valencia, Aug. 2-8, 7 cases, 1 death.
Straits Settlements: Singapore, July 5-11, 1 death.
Turkey in Asia: Bagdad, July 5-11, 32 cases, 5 deaths.
Turkey in Europe: Constantinople, July 26-Aug. 2, 6 deaths.

CHOLERA.

Ceylon: Colombo, July 5-11, 3 cases, 3 deaths.
China: Hongkong, July 5-11, 2 cases, 2 deaths.
India: Bombay, July 15-21, 2 deaths; Calcutta, July 5-11, 28 deaths; Madras, July 11-17, 9 deaths; Rangoon, July 5-11, 7 deaths.
Indo-China: Cholen, July 5-11, 7 cases, 7 deaths; Saigon, 3 cases, 1 death.
Persia: Teheran, June 27-July 3, 1 case, 1 death.
Philippine Islands: Provinces north of Manila, June 28-July 4, 614 cases, 331 deaths.

YELLOW FEVER.

Brazil: Manaos, July 12-Aug. 1, 5 deaths; Para, Aug. 2-8, 2 cases, 1 death.
Cuba: Daiquiri, July 31, 1 case.
Mexico: Merida, Aug. 23, 1 case; Vera Cruz, Aug. 21, 1 case.

PLAGUE.

Chili: Antofagasta, July 14-20, 3 cases; Arica, July 16-22, 1 case; Iquique, July 14-21, 3 cases, 2 deaths.
China: Foochoo, July 12-18, present; Hongkong, July 5-11, 36 cases, 28 deaths.
Indo-China: Cholen, July 5-11, 17 cases, 17 deaths; Saigon, 2 cases, 2 deaths.
Japan: Kobe, July 19-25, 2 cases, 3 deaths.
Peru: General, July 14-20, 17 cases, 15 deaths.
Trinidad: July 23-28, 1 case, 1 death.
Turkey in Asia: Bagdad, July 26-Aug. 2, 3 cases, 2 deaths.

Marriages

REID NEBINGER, M.D., to Miss Ava Grier Gearhart, both of Danville, Pa., recently.

R. H. PAYNE, M.D., Richland, Iowa, to Miss Ella Bohan of Seaton, Ill., August 11.

ALFRED C. WIEBUSCH, M.D., Cora, Ill., to Miss Anna Fiene of Steeleville, Ill., August 20.

FREDERICK W. WICHMAN, M.D., Seattle, Wash., to Miss Alma M. Bergman of Chicago, July 2.

WILLIAM P. SAWYER, M.D., Nevada City, Cal., to Miss M. Helen Ransom of Sebastopol, Cal., August 12.

E. S. EVANS, M.D., Brooklyn, Iowa, to Miss Mara Baldwin of Whitewater, Wis., at Bisbee, Ariz., July 28.

THOMAS ROBERT FRANCIS, M.D., Connellsville, Pa., to Miss Jeannette Martha Daily of Buckhannon, W. Va., August 10.

ERNEST GREY BINGHAM, M.D., captain Medical Corps, U. S. Army, to Miss Laura Churchill Thompson, at Buffalo, N. Y., August 18.

CARLTON EDGAR UBER, M.D., Parsley, Md., to Miss Nellie Stewart Parker of Pastoria, Va., at Ellicott City, Md., August 3.

WILLIAM R. MOULDEN, M.D., Friendship Heights, Md., to Miss Naomi B. Stewart, at "Woodside," near Boyd's, Md., August 19.

Deaths

Henry Archibald Tobey, M.D. Miami Medical College, Cincinnati, 1875; of Toledo; formerly a member of the American Medical Association; assistant physician at the Columbus State Hospital from 1877 to 1880; superintendent of the Dayton State Hospital from 1880 to 1884; and in 1886 made superintendent of the Toledo State Hospital for the Insane; said to have been the originator of the cottage plan for segregation of patients in state hospitals for the insane; an alienist of repute; died suddenly at his summer camp at Huntsville, Ont., August 18, from heart disease, aged 56.

William Mavel Nickerson, M.D. University of Pennsylvania, Department of Medicine, Philadelphia, 1867; a member of the Colorado State Medical Society and Association of Military Surgeons of the United States; assistant surgeon U. S. Navy, retired; who entered the Navy in 1867 and was retired in 1874 for incapacity resulting from incident of service; and has made his home in Denver for 18 years; formerly a member of the state board of pardons; died in Fort Collins, Colo., August 19, from acute gastritis, aged 62.

James P. Scoles, M.D. College of Physicians and Surgeons of St. Joseph, Mo., 1880; a member of the Kansas Medical Society; formerly president of the Southeast Kansas Medical Society; and since its organization, 10 years ago, president of the Cherokee County Medical Society; a member of the American Association of Railway Surgeons; and local surgeon for the Frisco System; died at his home in Galena, Kan., August 16, after an illness of more than a year.

Edward LeRoy Smith, M.D. Bellevue Hospital Medical College, New York City, 1889; a member of the Medical Society of the State of New York; formerly president of the Binghamton Academy of Medicine; surgeon to the Binghamton fire department; coroner of Boone County; consulting surgeon to the King's Daughters' and Lestershire hospitals; died at his home in Binghamton, August 19, after an illness of a year, following an automobile accident, aged 44.

Rufus Baldwin Whitehead, M.D. College of Physicians and Surgeons in the City of New York, 1893; a member of the American Medical Association; of Elizabeth, N. J.; attending surgeon and obstetrician to the Elizabeth General Hospital; is said to have died from the effects of a self-inflicted gunshot wound of the head at Portland, Maine, August 20, while temporarily insane from overwork, aged 36.

Charles E. Parish, M.D. Albany (N. Y.) Medical College, 1880; a member of the Medical Society of the State of New York; coroner of Otsego County for two terms; for 10 years a member of the board of town supervisors, and for several terms chairman of the board; died at his home in Maryland, August 15, from nephritis, after an illness of five months, aged 53.

Walter Julien Sleeper, M.D. Dartmouth Medical School, Hanover, N. H., 1882; a member of the American Medical Association; medical examiner for the tenth (Middlesex) district of Massachusetts; a specialist on diseases of the chest; died at his home in Westford, Mass., August 12, from pernicious anemia, after an illness of eight years, aged 48.

Harvey D. Danford, M.D. Medical College of Ohio, Medical Department, University of Cincinnati, 1870; a member of the Ohio State Medical Association; a veteran of the Civil War; and for several years United States pension examining surgeon for Athen County, Ohio; died at his home in Trimble, August 21, after an illness of several months, aged 63.

Edward G. Thomasson, M.D. Medical College of Ohio, Medical Department University of Cincinnati, 1880; a member of the Kentucky State Medical Association, and one of the best-known practitioners of Newport, Ky.; died in Christ Hospital, Cincinnati, August 23, following an operation for disease of the kidney, after a short illness, aged 43.

Benjamin Douty Ashton, M.D. Cleveland Medical College, 1854; a member of the state legislature in 1887; surgeon in the volunteer service during the Civil War; and president of the village of Traverse City in 1886; died at his home in Traverse City, Mich., August 6, from cerebral hemorrhage, after an illness of five days, aged 79.

James D. Russell, M.D. Kentucky School of Medicine, Louisville, 1870; a member of the Kentucky State Medical Association, and one of the most prominent practitioners of western Kentucky; for several years president of the Daviess County Medical Society; died at his home in Yelvington, August 2, from a congestive chill, aged 62.

Edwards Clemmons McEachern, M.D. Medical Department, University of North Carolina, Chapel Hill, 1899; University of Maryland School of Medicine, Baltimore, 1901; a member of the Medical Society of the State of North Carolina; died in Asheville, N. C., August 17, from tuberculosis, after a long illness, aged 28.

Albert E. Douglas, M.D. New York University Medical College, New York City, 1890; speaker of the provincial legislature of Prince Edward Island; and a member of the provincial parliament since 1900; died at his home in Hunter River, P. E. I., May 6, from pleuropneumonia, after an illness of ten days, aged 47.

Henry Blane, M.D. Vanderbilt University, Medical Department, Nashville, 1886; a member of the Kentucky State Medical Association; assistant surgeon in the Confederate service during the Civil War; died at his home in Cadiz, Ky., August 19, after an illness of several months, from senile debility, aged 72.

Solomon D. Kell (License, Ind., 1897); a member of the American Medical Association; health officer of Union County, Ind.; secretary of the county board of health; and health officer of Liberty; for 40 years a practitioner of that place; died at his home, August 10, after an illness of three weeks, aged 67.

Hugh B. McMaster, M.D. Kentucky School of Medicine, Louisville, 1887; a member of the American Medical Association; and one of the most prominent practitioners of Waynesboro, Ga.; local surgeon of the Central of Georgia Railway; died in Tryon, N. C., August 21, after a long illness, aged 52.

Alpheus Orlando Buster, M.D. Medical Department of Fort Worth University, Fort Worth, Texas, 1899; a member of the American Medical Association; who had recently returned from China; died at his home in El Paso, Texas, from tubercular meningitis, April 25, after an illness of ten days, aged 36.

Georgiana Delaney Read, M.D. New York Medical College and Hospital for Women, 1882; for 14 years resident physician at the Moses Brown School, Providence, R. I.; died in the Homeopathic Hospital in that city August 21, from heart disease, following an attack of pneumonia, aged 66.

Bennett Frank Godfrey, M.D. Chattanooga, Medical College, Medical Department, Grant University, Chattanooga, Tenn., 1897; of Laurens, S. C.; a member of the South Carolina Medical Association; died from internal hemorrhage, 20 hours after a runaway accident, August 14, aged 35.

Peter Dockler, an old practitioner of Onaga, Kan.; said to have been a surgeon in the French army; a veteran of the Mexican and Civil Wars; died suddenly at his home in Onaga, March 30, from senile debility, aged 102.

Frank B. Glenn, M.D. Medical College of Virginia, Richmond, 1907; of Richmond, Va.; an interne at St. Vincent's Hospital, Norfolk; died in that institution, August 11, after an operation for appendicitis, aged 30.

George H. Smith, M.D. New York Homeopathic Medical College and Hospital, New York City, 1869; died at his home in Williamsburg, Brooklyn, August 20, from septicemia due to an operation wound, after an illness of three weeks, aged 64.

Julien A. Smith, M.D. New York University Medical College, 1882; a member of the Medical Society of the State of North Carolina; of Durham, N. C.; died at the Watts Hospital in that city, August 14, after a surgical operation, aged 53.

Ira Benjamin Archer, M.D. Baltimore, 1890; died at his home in North San Juan, Cal., May 31, from the effect of a self-inflicted gunshot wound of the head while suffering from mental aberration, aged 44.

Albert F. Randolph, M.D. State University of Iowa, College of Medicine, Iowa City, 1891; of Koszta, Iowa; a member of the Iowa State Medical Society; died in a hospital in Sioux City, Iowa, January 11.

George Washington Pangle, M.D. King Eclectic Medical College, Des Moines, Iowa, 1885; died at his home in Council Bluffs, Iowa, August 13, from kidney disease, after an illness of three weeks, aged 62.

William Hicks Cunningham, M.D. Medico-Chirurgical College of Philadelphia, 1904; died at his home in Vineland, N. J., August 10, from recto-vesical abscess, after an illness of six weeks, aged 47.

Clempson B. Kennedy, M.D. Jefferson Medical College, Philadelphia, 1870; of Parsons, Kan.; a pioneer practitioner of Labette County; died suddenly at Erie, Kan., August 15, from heart disease.

James A. Lonsdale, M.D. American Medical College, Eclectic, St. Louis, 1891; of Detroit, Mich.; died suddenly from cerebral hemorrhage, at Grace Hospital, Detroit, August 12, aged 63.

Elisha B. Adams, M.D. Vanderbilt University, Medical Department, Nashville, Tenn.; a practitioner of Emory, Texas, for 15 years, died February 15, from pneumonia.

John S. Moore, M.D. University of Louisville (Ky.) Medical Department, 1874; died at his home in New Hope, Ky., August 20, after a prolonged illness.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF ORGANIZATION, POSTGRADUATE WORK, CONTRACT PRACTICE, INSURANCE FEES, LEGISLATION, ETC.

The Doctor as a Public Educator.

The above is the theme of a practical paper in the *New York Medical Journal*, July 25, by Dr. Frank Van Fleet. After emphasizing the duties of the doctor as a public educator and commenting on the spirit of indifference generally shown toward such responsibility, Dr. Van Fleet inquires into the reasons for such indifference, and this he attributes to the tendency of American citizens to allow politicians to make the laws. In European and South American republics, physicians often participate in public life. In the New York state legislature for last year seven of the 201 members were licensed physicians. Dr. Van Fleet holds it is not opportunity but influence which is lacking. He says:

> There is nothing to indicate that the presence of the seven physicians in the legislature of New York exerted any influence one way or the other on the bills introduced in the body having to do with the public health. I think I can say without fear of contradiction that in the thirteen years that I have been connected with the committees on legislation of the state or county medical societies, I can not recall a time when the presence of a physician as a member of the legislature had the slightest influence in any way.

He believes, however, that the medical profession is capable of exerting a great influence for good if it were willing to do so. He says:

> People are willing to be guided by us along medical and public-health lines because they think we have knowledge which they do not possess and that we, as a profession, are not actuated by selfish motives. They look to us for enlightenment, or in other words, they look to us to guide them and they ought not to look in vain. This age in which we live is an age of education; indeed, the people are education crazy. They are clamoring for information and if they can not obtain it from reliable sources, they will get it from sources which are unreliable. . . . I am glad to note that our profession is coming to see the logic of this and that many of the leaders of the profession are manifesting a greater willingness to talk to the public on these vital questions than heretofore. . . . We should be public educators, and I hail the coming day when our medical societies will give public lectures on public health subjects as the Medical Society of the County of Kings has been doing the past winter months.

Among the subjects on which the public needs enlightenment is medical legislation. Van Fleet believes that the purpose of medical practice laws is to protect the public, with the infliction of the least possible hardship on those who would practice medicine. He holds, however, that the medical laws in this country do not protect the public, but impose on those who comply with them an unnecessary amount of hardship, while special laws permit a privileged class to practice medicine in special lines for which they are not fitted. This practically amounts to penalizing the properly educated physicians and putting a premium on ignorance.

The management of public schools and the systematic inspection of pupils, the control of tuberculosis and other infectious diseases, the absurdity of the recent antivivisection craze, and the ignorance of governors and legislators in securing laws making physicians out of opticians, are also discussed. The duty of the medical profession to see that questions relating to public health are properly placed before the people is strongly emphasized. Dr. Van Fleet feels that the public, when once enlightened, will support the medical profession in its efforts to secure better conditions and that if the people do not cooperate with the physicians, it is because they do not understand the questions at issue.

A Reductio ad Absurdum of Ethics.

There is a proverb to the effect that "one can not have too much of a good thing." But we must not forget that in this life at any rate the absolute good is never attainable and that that which was good at a given time and under given conditions may cease to be good at another time and under other conditions. We are moved to these remarks by a discussion on the Ethics of Medical Consultation by the Central Ethical Committee of the British Medical Association,[1] where the following amendment was proposed to the rule regarding the non-supplanting of the attending physician by another physician called in consultation.

> "A practitioner who has seen a case in consultation should not supersede the attending practitioner or attend the case in any future illness without the permission of the introducer."

1. Brit. Med. Jour., Aug. 1, 1908, Supplement, p. 125

This drastic amendment appears to have been brought forward at the instance of a divisional ethical committee (a division corresponds organically to a state association in the American Medical Association), which held that "if a patient would not continue with the original practitioner he might call in any other except one who had been introduced as a consultant." This bubble of sapiency was pricked by the suggestion that a man, who had been practicing unopposed in a country village, suddenly confronted with a younger and more vigorous man, would only need, in order to protect his own practice, to call the other physician into consultation all round as quickly as possible. Needless to say the amendment was not carried.

The whole argument hinges on a misconception. The proposer of the amendment stated: "It was said that this was an attempt to interfere with the rights of the patient, but the rights of the practitioner must be asserted." The practitioner, however, has no rights at all, so far as regards the patient's freedom of choice, beyond the right that every gentleman has to be treated as a gentleman—i. e., with ordinary courtesy. He has rights, however, against his brother practitioner, the consultant, which can be enforced in a disciplinary manner through ethical committees, if the consultant can be shown to have used any measures tending to cause the patient to waver in his allegiance to his regular attendant. It is true that it is often difficult to prove such treachery, and also that those who are capable of committing it are the very ones least likely to stand in awe of any disciplinary enactments; but that is hardly an adequate reason for penalizing patients generally, to add persuasiveness to the decrees of an ethical committee in occasional instances. The worst injury that can be inflicted on any good cause is to render it ridiculous.

POSTGRADUATE COURSE FOR COUNTY SOCIETIES.

DR. JOHN H. BLACKBURN, DIRECTOR.
BOWLING GREEN, KENTUCKY.

[The Director will be glad to furnish further information and literature to any county society desiring to take up the course.]

First Month.

THIRD WEEKLY MEETING.

CHRONIC VALVULAR LESIONS, LEFT HEART.

AORTIC LESIONS.

REGURGITATION.

Etiology and Pathology.—Age, sex and frequency. Congenital malformation, usual changes in valves; endocarditis, valvular changes; arteriosclerosis, (a) strain from exertion, occupation, etc., (b) alcohol, (c) syphilis, valvular and aortic changes; rupture of segment of valve; relative insufficiency, dilated ring. Mechanics: regurgitation, dilatation of ventricle, hypertrophy later, "cor bovinum," arterial anemia, mitral incompetency, effect on left auricle, on right heart, myocardial changes.

Physical Signs.—Inspection: apex beat, pulsation, cardiac and arterial. Palpation: cardiac thrill, pulse, sphygmographic tracings. Percussion: outline of dulness. Auscultation: murmur, time, site, intensity, transmission. Character of normal sounds. Secondary murmur.

STENOSIS.

Etiology and Pathology.—Age, sex, frequency. Adhesion of segments, thinning or thickening of segments, calcareous deposits. Relative stenosis, with dilated aorta. Associated incompetence. Mechanics: increased resistance, hypertrophy, dilatation later, auricular changes, effect on lungs and right heart.

Physical Signs.—Inspection; apex beat, impulse, emphysematous chest. Palpation: thrill, intensity and location, pulse. Percussion: area of dulness. Auscultation: murmur, quality, time, location, intensity, transmission. Normal heart sounds. Sphygmographic tracings.

MITRAL LESIONS.

REGURGITATION.

Etiology and Pathology.—Age, sex, frequency. Changes in segments and chordæ tendineæ, endocarditis. Calcareous plates or rings. Associated stenosis. Changes in ventricular walls, dilatation or muscular incompetence. Mechanics: regurgitation, dilated auricle, hypertrophy, dilatation and hypertrophy of left ventricle, changes in right ventricle, in right auricle, in pulmonary vessels, in lungs, later in systemic veins, changes in viscera, "dropsy."

Physical Signs.—Inspection: apex beat, ventricular and venous impulses. Palpation: thrill, impuse, pulse. Percussion: area of dulness. Auscultation: murmur, character, time, location, intensity, transmission, effect of posture. Normal heart sounds.

STENOSIS.

Etiology and Pathology.—Age, sex, frequency. Endocarditic changes, in segments, ring, chordæ tendineæ. Associated incompetence. Congenital origin? Mechanics: stenosis, dilatation and hypertrophy of auricle, effects on pulmonary artery and veins, changes in right ventricle, relative tricuspid incompetency, effects on systemic veins.

Physical Signs.—Inspection: apex beat, impulse, right ventricle. Palpation: thrill, impulse, pulse. Percussion: area of dulness. Auscultation: murmur, character, location, time, transmission. Normal heart sounds. Sounds in "broken compensation."

Medicolegal

"Pulling Down Sensation" to be Assumed.

The Kansas City Court of Appeals does not agree with the contention in the personal injury case of Saeger vs. Wabash Railroad Co., that an instruction given the jury was vicious and prejudicial to the defendant in calling special attention to the "pulling down sensation or prolapsus of the womb," when there was no evidence of such sensation. The court says that as the plaintiff's injury resulted in prolapsus uteri, it was not necessary to prove such sensation, for prolapsus is a pulling down of the womb, and it is to be assumed that the sensation naturally and necessarily follows.

Prior Treatment Subject for Cross-Examination.

The Supreme Court of New York, Appellate Division, Second Department, says, in the personal injury case of Seaman vs. Mott, that when the patient called the physician to give evidence as to injury, pain, and suffering attributed to the accident, the patient could not exclude, as privileged, questions by the defendant as to professional treatment prior to this accident, for such questions might have shown the prior existence of such physical conditions, at least to a degree. The principle of privilege is not intended, as the courts have said, to be both a sword and a shield for the patient.

Admissibility of Evidence of Condition of Eyes as Proof of Internal Injury.

The Court of Appeals of Kentucky says that one of the questions in Louisville Railway Co. vs. Ellerhorst, a personal injury case brought by the latter party, was what evidence was competent to sustain the allegations of the plaintiff's petition. She alleged in her petition that she was injured in her womb, in her ovaries, in her bowels; that she had had frequent micturition; and that she had sustained a shock to her nervous system. A diseased condition must be manifested by outward symptoms. If the plaintiff had been unable to show any external manifestations of the injuries of which she complained, the jury would reasonably conclude that she was not as badly hurt as she alleged. If she had shown that she had suffered from insomnia since the accident, and had been a healthy woman up to that time, it would have been some evidence of a nervous derangement. A nervous shock often shows itself in the eyes; and, if the plaintiff's eyes had remained normal it would have been some evidence that the

nervous shock was not very serious. Where specific injuries are sued for, any external symptoms which are evidence of the injury may properly be admitted, for it is only by the external symptoms that an internal injury may be judged. As the injury to the plaintiff's eye was not sued for, the court properly excluded it from the consideration of the jury in fixing damages; but, as it furnished some evidence of the internal injury of which she complained, the proof was properly allowed to go to the jury.

Restriction on Power to Exclude Unvaccinated Pupils.

The Supreme Court of Illinois says, in People, on the relation of Louise Jenkins vs. Board of Education of City of Chicago, that not only has the legislature never prescribed vaccination as a condition to the enjoyment of the legal right to attend public schools, but it has never conferred on cities the power to do so. If the city of Chicago has power to pass any ordinance on the subject, the power is derived from the authority conferred on the city council to appoint a board of health and prescribe its powers and duties, to do all acts and make all regulations which may be necessary or expedient for the promotion of health or the suppression of disease, and to pass all ordinances and rules, and to make all regulations proper or necessary to carry into effect such authority.

The general police powers above enumerated to pass ordinances and make regulations for the promotion of health or the suppression of disease do not include the passage of an ordinance making vaccination a condition precedent to the right to an education, such as one passed by the city of Chicago, one section of which provided: "No principal or person in charge or control of any school shall admit to such school any child who shall not have been vaccinated within seven years next preceding the admission or application for admission to any such school of such child, nor shall any such principal or person retain in or permit to attend any such school any child who shall not have been vaccinated as provided in this article."

An ordinance passed by reason of such authority must be reasonable in its character, and rest on the ground that it is a necessary means of preserving the public health. In the case of Potts vs. Breen, 167 Ill., 67, it was held that the exclusion of a child from a public school because of a refusal to be vaccinated can only be justified where such course is necessary, or reasonably appears to be necessary, in case of an existing or threatened epidemic of smallpox, and to prevent the spread of the disease. In the case of Lawbaugh vs. Board of Education, 177 Ill., 572, the court adhered to those principles, and declined to further discuss them, although earnestly urged to reconsider the former decision.

The section of the ordinance quoted was null and void and afforded no justification for denying the relator admission to the school, whether the denial of her right was at the instance of the health commissioner, the health department, or any other authority.

The answer alleged, as a matter of fact, that on Oct. 29, 1907, the disease of smallpox was prevalent in the district in which the school was located, within such a radius as to make it dangerous for all persons therein residing who had not been vaccinated; that the commissioner of health declared smallpox to be epidemic in said district, and instructions were given by the health department to exclude all children who had not been vaccinated in accordance with the terms of the ordinance.

The terms of the ordinance were that no child should attend the public schools who had not been vaccinated within seven years, and did not constitute a lawful exercise of any power conferred on the city. The health commissioner was a purely ministerial officer and had no legislative powers whatever. The ordinance did not purport to give him authority to exercise such powers or to make any rules or regulations, except in cases of emergency, until they could be reported to the city council for approval or rejection. He could only be authorized to perform administrative duties in pursuance of some ordinance of the city, and there was no valid ordinance authorizing the exclusion of the relator from the public school which she had a legal right to attend.

There is nothing in the nature of an emergency in the occasional recurrence of the well-known disease of smallpox in a city like Chicago which may not be provided for by general rules and regulations prescribed by the legislative authority of the city. The board of education, which had charge of the public schools, had made no rule or regulation on the subject of such epidemics, and neither had the city council. The board's answer did not make known any ordinance, rule, or regulation for the exclusion from the schools of children not vaccinated in the event that an epidemic of smallpox existed in the vicinity of a school, or was reasonably apprehended, and, in the Supreme Court's opinion the trial court erred in overruling a demurrer to the answer.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

Boston Medical and Surgical Journal.

August 20.

1 *Surgical Rights of the Public. J. C. Munro, Boston.
2 High-Frequency Electricity in Treatment of Cardiac Disease. H. C. Arnold, Boston.
3 Border-Line Cases of Mental Deficiency. C. C. Beckley, Lancaster, Mass.
4 High-Grade Mental Defectives. W. N. Bullard, Boston.

1. **Surgical Rights of the Public.**—In this article, the address in surgery before the Canadian Medical Association, Munro emphasizes some points which are usually overlooked in the practice of surgery. He begins by referring to the German system of insuring the laboring classes against sickness and states that the insurance was established because the poor have a right to be protected against the various accidents and illnesses incident to our complex modern life. He then goes on to state that both rich and poor have an equal right to be protected against unnecessary suffering, disease and death. Using this as a text, he calls attention to the question of elective major surgery as attempted in large or small surgical centers by men without surgical skill, by amateurs, and by the nondescript commercial type of man who operates for the fee and not for the benefit of the patient. He condemns the internist who deals with a surgical lesion until forced to advise an operation, not as a preventive or as a curative measure, but as a last resort. Munro believes that all the facts in the case should be laid honestly before the patient early in the disease and that he be allowed to decide whether or not he will accept the operative risk. Munro also deplores the practice of some staff surgeons in allowing internes with only a few months' experience to undertake major operations, and asserts that to place the responsibility for a major operation on an inexperienced man is not only fundamentally wrong but occasionally criminal. He also says that the after-treatment should be supervised by the surgeon himself and not left to assistants. A patient consults a surgeon because of his experience and ability, and it is not right, says Munro, that the surgeon should evade the responsibility. He emphasizes the importance of skilled anesthetists and declares that an unskilled anesthetist can prolong beyond the limits of safety an operation that would be short, and that he increases the danger of postoperative pneumonia. The same criticisms apply to the ever-changing house surgeons and the general practitioners who assist in major operations. He advocates reform in the present system of hospital management. As constituted at present, he asserts, many public hospitals are overweighted by cumbersome surgical staffs which could be reduced to one-third or one-sixth of their present number. A chief of staff should be in charge of from 50 to 100 beds. If he has a larger number his assistants or colleagues should be capable of assuming charge in an emergency. He should be allowed great freedom in choosing his assistants, who should have demonstrated their fitness while in subordinate positions. Promotion should be for ability and not by reason of seniority. The routine inexpert work in the laboratories and wards should be performed by students delegated by the schools and

accepted without competitive examination, because such work should be part of the student's curriculum. In conclusion he states that he would not have it inferred that there is no other side to surgery than fault-finding and criticism. No profession is without flaws. Every profession reaches a higher plane with each decade, and it is mainly by the elimination of the petty obstacles that our profession is destined to attain a level that can never be reached by others.

Medical Record, New York.

August 22.

5 Appearance of Heteroplastic Tumors in the Transplantations of the New Growths of Animals. Dr. von Leyden and Carl Lewin, Berlin.
6 *Recurrent and Abductor Paralysis of the Larynx: Diagnosis and Treatment. W. E. Casselberry, Chicago.
7 Medical Treatment of Appendicitis. G. E. Crulkshank, Windsor, Ont.
8 Physiology and Pathology of the Emotions; the Physical Bases of Mental Etiology. H. Wakefield, New York.
9 Marriage from a Medical View Point. C. G. Cumston, Boston.
10 Sterility in Women. B. S. Talmey, New York.

6. **Paralysis of the Larynx.**—Casselberry discusses the diagnosis of unilateral recurrent nerve paralysis which when complete results in the fixation of one vocal cord in the cadaveric position. The cracked, raucous voice is suggestive rather than distinctive, but it is usually the one small symptom which first causes the patient to seek relief. The same is true of the partial stridor which may or may not usher in unilateral abductor paralysis in which, the dilator muscle alone being powerless, the vocal cord is retained in a position closing over one-half of the larynx. In 40 cases of the "aneurismal group" the left recurrent nerve was paralyzed by an aneurism in eight and the right recurrent in six, including in both numbers those in whom the opposite cord was likewise but less affected. In the "pleuritis group" all the cases were of tuberculous origin. Means of confirming the diagnosis in this group are as yet sparse. Casselberry believes that the *x*-ray might be of use in excluding or demonstrating the presence of enlarged mediastinal glands, which in tuberculous individuals constitute a possible cause of pressure on the recurrent nerves on the left side; but on the right side enlarged glands so situated could scarcely be beyond the reach of palpation. In the "tumor group," unlike the "aneurismal group," the vocal disability appeared only as a late and gradual development. Esophagoscopy is useful in diagnosis of these forms of paralysis, although usually by the time a vocal paralysis supervenes in cancer of the esophagus the diagnosis is plain. The so-called lazy cord is a recognized symptom of carcinoma of the larynx, but Casselberry believes that it is not generally known that total immobility of a cord may be the first visible evidence of this condition. He also discusses vocal paralyses due to lesions in the medulla and in the cerebral cortex.

New York Medical Journal.

August 22.

11 *Cystitis. R. E. Davison, Pittsburg, Pa.
12 Two Unusual Cystoscopic Pictures. J. B. Squier, New York.
13 *Car Sickness. I. S. Wile, New York.
14 Important Points in the Anatomy and Surgery of the Peritoneum. A. J. Woolf, Hartford, Conn.
15 *Oxygen in Treatment of Tuberculous Peritonitis. J. A. McGlinn, Philadelphia.
16 Etiology and Treatment of Eczema. Z. Feldstein, New York.
17 Recent Work on Spirillar Fevers. F. P. Mackie, Bombay, India.

11. **Cystitis.**—Davison describes the interior architecture of the normal bladder as seen by cystoscopy. In the etiology of cystitis he regards trauma, congestion and retention of urine as the predisposing causes and micro-organisms, of which the colon bacillus is first in order of frequency, as the direct cause. The gonococcus, strange to say, appears eighth on the list in Casper's classification, which Davison quotes. A few bacteria throw off ferments which decompose urea forming a carbonate of ammonium. The chemical reaction of the urine in cystitis is usually acid. Bacteria may gain entrance to the bladder in many ways, of which the urethra is the most common. The length of the male urethra protects the bladder from invasion to some degree, but the short female urethra offers little protection. Descending infections from the kidneys and ureters have of late been given an important place in the causation of cystitis. Davison discusses the pathology, symptomatology, diagnosis, prophylaxis and treatment, which includes free use of pure water, light and bland food, prohibition of alcoholic beverages except in the weakened and aged, and the administration of hexamethylenamin. In acute cystitis the patient should be put to bed with hips elevated. Heat and anodynes are recommended, and infusion of buchu seems to possess curative properties. In chronic cystitis the cause must be removed, the bladder cleansed by irrigation, the reaction augmented, and the local blood supply improved. He gives various antiseptic solutions for irrigation. In the female the short urethra allows topical applications to be made, e. g., a 10 per cent. solution of silver nitrate applied through the Kelly cystoscope. The author is not in sympathy with the cystotomies done for the relief of cystitis in women or in men. It is questionable whether they should ever be done, with the possible exception of cystitis caused by a malignant growth in the bladder. The procedure is opposed in every sense to the pathology present.

13. **Car Sickness.**—Wile discusses the various views regarding sea sickness and remarks on the paucity of literature concerning its analogue, car sickness, by which is meant the series of unpleasant symptoms, such as giddiness, staggering, nausea, vomiting, etc., due to riding in various vehicles. He regards car sickness as a functional neurosis. He points out that while sea sickness and car sickness belong to the same category of neuroses, they are not necessarily identical in origin or course; first-class sailors may suffer from car sickness, and very poor sailors may be free from it. It is comparatively common in infancy, usually beginning in fact in childhood. It is more frequent among females than males and appears to have an hereditary tendency, for Wile has frequently noted car sickness occurring in three generations, but in the female members only. He considers its relation to a lack of proper balance. All senses contribute to the sum of sensation essential for a sense of equilibrium. If any part of the sensory impressions is erroneous or departs from the individual normal, a disturbance of the sense of equilibrium results, and certain reflex conditions, nausea, pallor, rapid pulse, clammy skin, vomiting, etc., ensue. He considers in detail the various routes of affection of the different senses, and concludes that car sickness is a motor neurosis due to a disturbance of equilibrium, dependent on irritation of the vestibular nerve, originating in disturbance of the endolymph. He closes with the following practical points: Parents seldom say their children suffer from car sickness unless specifically asked. The vomiting of car sickness at times may suggest an overloaded stomach or the onset of an infectious disease. In adults car sickness has frequently caused a suspicion of drunkenness to fall on its victim; it has also been mistaken for appendicitis. It is most important to distinctively exclude car sickness in all cases of acute illness occurring on trains and other cars, just as one must distinguish sea sickness from other sickness at sea. The condition of a car sick person may appear most serious—in fact, suggest a fatal outcome, but this does not occur. A careful study by otologists and pathologists of intraaural conditions in children known to have car sickness might give some little light on the true proximate cause of what is now merely termed a neurosis.

15. **Oxygen in Tuberculous Peritonitis.**—McGlinn points out that three types of tuberculous peritonitis are recognized: the ascitic, the fibrous and the ulcerated. He quotes various authorities to show that by the plans of treatment now in vogue the fibrous and ulcerous forms of tuberculous peritonitis are not amenable to treatment, and that at best only 75 per cent. of the ascitic forms can be cured. Since April, 1904, he has used oxygen in 15 cases, 4 of which were of the fibrous variety, with excellent results, notwithstanding that his reasoning he now considers faulty. He briefly reports the 4 cases, and describes the method as follows: The water bottle of the oxygen apparatus is sterilized and filled with sterile water. The tube leading from the bottle and the rubber tip are sterilized. The tip is covered with several thicknesses of sterile gauze. The oxygen is introduced through the abdom-

inal incision until the abdomen becomes inflated. The incision is then closed with gauze, and the oxygen is allowed to remain for several minutes. The gas is then allowed to escape, and the peritoneal cavity is filled again and again.

Lancet-Clinic, Cincinnati.

August 22.

18 Internal Rotation and Lacerations of the Perineum. G. B. Twitchell, Cincinnati.
19 *Perineal Section for Obstruction of Prostatic Urethra. C. E. Barnett, Ft. Wayne, Ind.
20 Relation of the Physician to the Administration of Justice. G. Bambach, Ripley, Ohio.

19. Abstracted in THE JOURNAL, Nov. 2, 1907, p. 1552.

The Medical Fortnightly, St. Louis.

August 10.

21 Medical Treatment of Gallstone Disease. R. W. Wilcox, New York.
22 Loss of Appetite. J. F. Chandler, Forest City, Mo.
23 Problems of Biologic Chemistry. J. Clements, Wichita, Kan.
24 Treatment of Tuberculosis in Private Practice. M. H. Fussell, Philadelphia.

University of Pennsylvania Medical Bulletin, Philadelphia.

July.

25 *Review of Cases of Various Types of Enteroptosis. J. W. Luther, Philadelphia.
26 Postgraduate Study in Berlin. F. E. Keene, Philadelphia.
27 Care of Postoperative Patients, with Special Reference to Intestinal and Renal Functions. S. W. Moorehead, Philadelphia.
28 Calcified Pancreatic Cyst. G. W. Outerbridge, Philadelphia.
29 Acute Lymphopenic Lymphatic Leukemia. R. S. Lavenson, Philadelphia.

25. **Enteroptosis.**—Luther reports thirty-five cases of various types of enteroptosis, and states that the symptoms divide themselves into three groups, viz., neurotic; abdominal pains and unusual sensations; gastrointestinal disturbances. In ptosis of the stomach and transverse colon these three groups are perhaps most severe, the second group of pains being most vague and least frequent. The third group refers particularly to gastric derangements. In redundancy and ptosis of the sigmoid, the first two groups occur most frequently. The pains are more definitely located and severe. The gastrointestinal disturbances are limited, as a rule, to irregularities in the evacuation of the bowels. As a consequence of the uncertainty of symptoms, the diagnosis of these conditions can not be made safely without some mechanical or physical aid. Inflation of the stomach and colon enables one to outline the stomach and transverse colon with considerable accuracy, but the sigmoid can not always be located with the same degree of certainty. Here the *x*-rays are invaluable. In all cases in which ptosis of the hollow viscera is diagnosticated or suspected, a bismuth injection followed by an *x*-ray exposure should be employed. It not only makes or corroborates the diagnosis, but it aids the surgeon during the operation and enables him to plan a means of relief before the incision is made.

American Journal of Medical Sciences, Philadelphia.

August.

30 *Splenic Anemia, Splenectomy, and Recovery. With Studies of the Blood, Covering a Period of Seven Years. M. J. Lewis, Philadelphia.
31 *Laryngeal Tuberculosis. B. Robinson, New York.
32 *Primary Tuberculosis of the Mesenteric Glands. Report of Infections with Bacilli of the Human Type. A. F. Hess, New York.
33 *Blood Cultures in Typhoid. A. A. Epstein, New York.
34 Uncertain Results of Suturing Nerves. G. T. Vaughan, Washington, D. C.
35 *Pathogenesis of Tabes Dorsalis. T. A. Williams, Washington, D. C.
36 Herpetic Inflammations of the Geniculate Ganglion. A Syndrome Characterized by Herpes Zoster Oticus, Facialis, or Occipitocollaris, with Facial Palsy and Auditory Symptoms. J. R. Hunt, New York.
37 Present Status of Experimental Arterial Disease. I. Adler, New York.
38 *Bacteriology of the Puerperal Uterus. W. R. Nicholson and Joseph S. Evans, Philadelphia.

30. Abstracted in THE JOURNAL, June 6, 1908, p. 1930.

31. **Laryngeal Tuberculosis.**—Robinson says that in every case, and emphatically in young adults, in whom a cold or cough has unduly persisted despite rational treatment, or whenever the causation seems in any way obscure, we should invariably insist on a laryngeal examination. Often he has seen an ulceration of the vocal cord, or the arytenoid cartilage or commissure, of the arytenoid folds, and even of the epiglottis itself, when the laryngeal symptoms were not unduly pronounced. And these cases again occur, although perhaps infrequently, when the intrapulmonary condition is not perfectly clear and when no tubercle bacilli have yet been discovered in the sputum. The two essential things to be insisted on, in Robinson's opinion, in the way of protective and curative treatment, are: 1. Rest for the larynx; 2, inhalations. He rarely makes use of the galvanic cautery, and the later surgical methods of Krause and Heryng—punching and curetting do not appeal to him. As to posture, the patient lying with head hanging over the bed and sucking fluid through a rubber tube from a pitcher below will afford relief in swallowing. Robinson lays most stress, however, on the constant use of a perforated zinc inhaler covering the mouth and nose, and charged with creosote and alcohol, or, if there is much irritation, with beechwood creosote, alcohol and spirit of chloroform in equal parts. He emphasizes particularly the following facts: 1. There is a certain number of patients affected with laryngeal tuberculosis, just as those with pulmonary tuberculosis, who do not recover, in whom the disease is not even arrested no matter what treatment may be followed. These cases remain stationary, perhaps, for a little while, but even this is doubtful, and, as a rule, despite all our efforts and doings, the disease marches steadily onward and gradually grows worse until the end comes. 2. While we can not predicate absolutely, from the intralaryngeal evidences of tuberculous disease, as to the extent and stage of the tuberculous disease of the lungs, yet usually, if one localization of tuberculous disease is of bad augury, so is the other in the larger proportion of cases.

32. **Primary Tuberculosis of Mesenteric Glands.**—Hess summarizes his paper as follows: A review of cases of primary mesenteric gland tuberculosis in which the type of bacillus has been differentiated shows that over 60 per cent. have been caused by the bovine type of bacillus. Among children the bovine infections greatly prevailed, whereas in adults infections with the human variety were in the majority. No pathologic or clinical differentiation of the two forms of tuberculosis is as yet possible. In children, as well as in adults, bovine or human tuberculosis may become limited and healed and the bacilli may die. The cases reported in this paper, two in children and one in a young adult, were due to the human variety of bacillus, as shown by the morphology, cultural characteristics, and virulence of the isolated strains.

33. **Blood Cultures in Typhoid.**—Epstein sums up his paper with the following conclusions:

1. The bactericidal influence of the blood in typhoid fever in relation to the obtaining of positive results in the blood cultures has been overestimated. Great dilutions of the blood are not essential; a number of media will give good results.
2. The best results were obtained with the use of 2 per cent. glucose bouillon, 2 per cent. glucose agar, and ammonium oxalate solution.
3. On 2 per cent. glucose agar the typhoid bacillus grows in such a characteristic way that the presence of a certain type of colony on it is quite diagnostic, and the absence of such colony points very strongly against the presence of the typhoid bacillus.
4. The bile media were not found to be so reliable as the media mentioned above.
5. The results presented are in agreement with those obtained by others. The total positive results obtained are in agreement with the results obtained by others, notwithstanding the fact that more cases were studied later in the course of the disease.
6. Although the maximum results are obtained in the first and second week, there is not sufficient proof as yet that the bacilli are present in the blood from the very inception of the fever.
7. Protracted cases yield positive results if the continuation of the fever is not due to complications (or starvation).
8. A continued fever lasting several days after the blood has been shown to be free from typhoid bacilli will nearly always prove not to be a case of typhoid fever.
9. The results in relapse are the same as those in the primary attacks. The bacillemia in the relapse is due to a new invasion.
10. We can not draw any definite conclusion as yet concerning the value of the blood cultures in determining the prognosis.

35. **Tabes Dorsalis.**—This is a more elaborate paper than that on the same subject by the same author in the *Virginia Medical Semi-Monthly*, June, 1908, and abstracted in THE JOURNAL, August 1. He draws the following conclusions:

1. Tabes dorsalis is a secondary degeneration in the posterior columns, due to a chronic meningitis, very probably of syphilitic nature.

2. The arrangement of the meninges surrounding the radicular nerve renders it peculiarly susceptible at that spot to mechanical or toxic injury.
3. The unequal incidence of the affection on different fibers of the posterior root is probably due to unascertained peculiarity of structure or arrangement of fasciculi, rather than to any selective toxic influence.
4. The lesions tend toward resolution and arrest, even though the process may continue during the life of the individual.
5. With this arrest, regeneration tends to occur in the radicular nerve, the amount in the anterior root being relatively considerable, while that in the posterior root is less in amount and functionally insignificant, as a rule.
6. The otherwise inexplicable vasomotor and cranial nerve symptoms and postmortem findings in this disease are shown thus to be necessary concomitants of the tabetic process.
7. The question of the pathogenesis of the polyneuritic manifestations found in tabetics is not yet answered.

38. Bacteriology of Puerperal Uterus.—Nicholson and Evans say that taken in connection with the studies on the bacteriology of the blood which have been made in their clinic, they feel justified in making the following statements: 1, If both blood and intrauterine cultures are negative, the temperature is due to some intercurrent condition; 2, if the intrauterine culture is positive, but the blood culture is negative, they consider the infection to be still local in its manifestations; and 3, if the intrauterine culture is negative but the blood culture is positive—a very unusual condition—they are justified by their general conclusions in considering that the case is one of general infection, the local endometrial condition having been either sterile from the first, or having become so gradually after the general infection developed. They draw the following conclusions:

1. The uterine lochia is sterile in normal cases throughout the puerperium.
2. Streptococci are never present within the uterine cavity without causing symptoms.
3. In a few instances non-pathogenic germs may be found in cultures in afebrile cases, but there is every reason to believe that their presence is really the result either of contamination during the extraction of the lochia or of their introduction during obstetric manipulation.
4. Ascendance of the gonococcus is an event of comparative rarity, though the frequency of this organism would of itself give reason to expect otherwise.
5. Infection of the endometrium is an ever-present danger in culturing within a few days of delivery.
6. A study of the bacterial content of the puerperal uterus is of great importance as a subsidiary means of diagnosing septic infection following delivery.
7. As nearly as may be, a technic should be adopted which will prevent contamination during the removal of the lochia, in order to avoid a vitiated result.

Archives of Pediatrics, New York.

July.

39 *Public School Education. C. G. Kerley, New York.
40 *A Plan of Dealing with Atrophic Infants and Children. H. D. Chapin, New York.
41 *An Unusual Type of Acute Nephritis in Childhood. J. L. Morse, Boston.
42 *The Colored Children of Jamaica, with Especial Reference to Rickets and to Mongolian Spots. A. E. Vipond, Montreal, Canada.
43 *Need of Postgraduate Instruction in Pediatrics. A. Caillé, New York.
44 Recurring Empyema. F. Huber, New York.
45 Fatal Hemoptysis in Children. W. E. Magruder, Baltimore.
46 Sporadic Cretinism (Type Fruste). C. F. Judson and W. N. Bradley, Philadelphia.

39. Abstracted in THE JOURNAL, July 11, 1908, p. 157.

40. Abstracted in THE JOURNAL, July 18, 1908, p. 246.

41. Abstracted in THE JOURNAL, July 11, 1908, p. 156.

42. **Mongolian Spots.**—Vipond examined 217 children of Jamaica, West Indies, of whom 89 were pure black, 48 three-quarters black, 57 were Sambo (offspring of a negro and a mulatto), and the remaining 23 were light. He found Mongolian spots in 44—8 pure black, 18 three-quarters black, 15 Sambo, and 3 light children. Out of 28 children under one month old 22 had Mongolian spots; out of 40 at six months and under 27 showed the spots, and out of 50 children under one year 33 had spots. Thus there were Mongolian spots in 80 per cent. of colored children under ten days old, which percentage does not change to any degree up to a month. As they advance in age the percentage of spots lessens. If the child is too dark or too light the spots are less likely to be present. As to site, they were most frequent at the lower part of the sacrum, then in the gluteal region. They are also found on the back, shoulder, thigh, hip, lower leg, etc. The color of the spots varies from bluish to greenish.

43. Abstracted in THE JOURNAL, July 18, 1908, p. 246.

Bulletin of the Lying-in Hospital, New York.

March.

47 *Brachial Birth Palsy. P. Bailey, New York.
48 *Gangrene of the Extremities in the New-Born. G. W. Kosmak, New York.
49 *Prognostic Value of the Nuclear Count, Associated with Pregnancy and the Puerperium. E. Smith and A. Lansing, New York.
50 Complete Congenital Opacities of Both Corneæ. L. W. Callan, New York.
51 Status Lymphaticus. E. L. Coolidge, New York.
52 *Postpartum Bacteriemia. Z. E. Welch, New York.
53 Significance of Albuminuria in Pregnancy. F. E. Sondern, New York.

47. **Brachial Birth Palsy.**—Bailey points out that it is remarkable that brachial birth palsy did not come under systematic consideration earlier than the end of the nineteenth century, although doubtless as old as the human race. It concerns the obstetrician more than any other practitioner. While pressure is the generally accepted cause of the lesion, Bailey is of the opinion, with others, that most cases result, not from pressure on the plexus, but from traction on it. If the axis of the head is drawn away from the long axis of the body by 30 degrees the cords of the plexus are stretched to the danger point. This is liable to happen in vertex presentation to hasten the delivery of the shoulder, and in breech presentation to hasten the delivery of the breech. It may also happen in extraction by forceps, and in spontaneous birth the delivered head, by its own weight, may cause traction on the plexus. The type of palsy depends on the part of the plexus injured. The upper arm type is the common variety. The painful symptoms cause the child to lose much sleep and its nutrition is consequently retarded. The deformities are due to overaction of the non-paralyzed muscles. The electrical reactions in the paralyzed muscles are degenerative. The degree of disability and deformity varies with the extent of the lesion and with the treatment. In the cases in which movements begin within a few weeks of birth, a favorable result may be counted on. The treatment consists in passive motion, to prevent contracture, and in massage of the affected muscles. If this can be skilfully applied, electricity may be dispensed with. This treatment is not feasible until the hypersensitiveness, if it existed, has passed away.

48. **Gangrene of Extremities in the New-Born.**—Kosmak describes a case and adds a report of four cases from the literature. He says that it seems very probable that we have to deal with some form of sepsis, the exact nature of which is yet in doubt, as all other factors which might possibly produce gangrene of this type have been ruled out.

49. **The Nuclear Count in Pregnancy and the Puerperium.**—Smith and Lansing, as the result of observations covering 138 cases in the hospital, in which 315 blood counts were made, find that their results differ widely from those of Arneth in all departments of this work. They state that the uncertainty of the nuclear count in puerperal conditions, inflammatory and otherwise, can not be explained, and the results obtained from the study of gonorrheal pus, which seem to contradict Arneth's basic theory, would indicate that for the present at least little practical aid is to be found in the nuclear count. They record the results of their observations in tabular form.

52. **Postpartum Bacteriemia.**—Welch arrives at the following conclusions:

1. Postpartum bacteriemia warrants the very gravest prognosis.
2. A prognosis can not be given from the number of colonies per cubic centimeter of blood.
3. A prognosis can not be given from the length of chains found in case of streptococcal infection.
4. Virulence in the rabbit does not correspond to virulence in the human.
5. In 46 cases the percentage of recovery was 6+ per cent.

New Orleans Medical and Surgical Journal.

July.

54 Life and Work of James Carroll. J. McFarland, Philadelphia.
55 Annual Report of Dean of the Medical Department of Tulane University. S. E. Chaillé, New Orleans.
56 Pathology of Tuberculosis. O. L. Pothier, New Orleans.
57 *Tuberculosis of the Female Genitals. S. M. D. Clark, New Orleans.
58 *Tuberculosis of the Testicle—Diagnosis and Indications for Operation. S. P. Delaup, New Orleans.
59 *Tuberculosis of the Gastrointestinal Tract. R. Matas, New Orleans.

57. **Tuberculosis of Female Genitalia.**—Clark, in ten years' experience at the Charity Hospital gynecologic clinics, has not seen more than twenty cases. Secondary cases are more frequent than primary. There are no pathognomonic symptoms. He describes the clinical picture, differential diagnosis and treatment (which last consists of complete removal followed by plastic work) of tuberculosis of the vulva (the rarest form), of the vagina and cervix, of the uterus, ovaries and tubes. The tube is the explanation of the relative frequency of tuberculous peritonitis in the female. He discusses gastric and intestinal tuberculosis separately from a statistical viewpoint, and concludes with a statistical summary of the results of operative treatment by well-known surgeons.

58. **Tuberculosis of Testicle.**—Delaup says that tuberculosis of the testicle calls for operative surgical attention more frequently than does a like infection elsewhere in the genito-urinary tract. Still even here tuberculosis should be treated conservatively. He prefers epididymectomy unless the testicle is too far gone to be saved. Slight tuberculosis of the organ may be depended on, he asserts, to heal spontaneously after removal of the epididymis.

59. **Tuberculosis of Gastrointestinal Tract.**—Matas contrasts the past and present conceptions of gastrointestinal tuberculosis. It is a relatively frequent primary disease, independent of pulmonary or laryngeal infection and characterized by well-defined localized lesions which undergo a typical and systematic evolution into various well-recognized clinical types. These lesions are the result of the direct inoculation of the mucosa, submucosa and serosa of the intestine, with or without participation of the peritoneum or of the mesenteric lymphatics. The process, which begins as an ulceration surface, or as a tuberculoma, may terminate either in, 1, resolution and cicatrization; 2, cicatrization with hypertrophic changes simulating tumor formation in the region of the ulcerated patches; 3, perforation either into (a) the free peritoneal cavity, causing fatal peritonitis; (b) agglutinative peritonitis followed by entero-enteric fistula, or by (c) encysted purulent collections in the peritoneum, which either rupture externally or into the neighboring organs (bladder, bowel, pelvis of kidney, uterus, etc.) or, when opened surgically, are followed by fecal fistula; 4, stricture formation, after partial or complete cicatrization. This stricture formation may be single or multiple, according to the number and extent of the ulcerations. The modern concept differs from the old, in the conviction based on clinical, operative and cadaveric experience, that the tuberculous process in the intestines is more amenable to spontaneous cure than was formerly supposed; that the protective reactionary processes shown by the connective tissue in the submucosa and serosa are more effective and more frequently exhibited than was previously taught; that the ulcerative process is, more latent, insidious and symptomless in its active stages, and that the greatest evils which result from the intestinal localizations of the tubercle bacillus in the alimentary canal are due to protective, conservative and reactionary tissue changes.

Indiana Medical Journal, Indianapolis.

July.

60 The Necessity of Accurate Vital Statistics. C. A. Carter, Indianapolis.

Journal of the Medical Society of New Jersey, Orange.

July.

61 *Medical Expert Testimony. E. J. Ill, Newark.
62 *When Shall the Physician Distrust His Own Judgment in Surgical Matters? M. H. Richardson, Boston.
63 *Joint Affections Caused by Infectious Diseases. W. K. Newton, Paterson.
64 Progress of Modern Psychiatry. H. A. Cotton, Trenton.

August.

65 Hernia as Understood and Treated at Different Epochs by the Past and Present Masters of Surgery. T. H. Mackenzie, Trenton.
66 Diagnostic Importance of Vomiting in Childhood. A. Stern, Elizabeth.
67 Etiology and General Bacteriology of Typhoid Fever. F. S. Hammond, Trenton.
68 Account of the Sewage Plant Established at the State Tuberculosis Sanatorium. S. B. English, Glen Gardner, N. J.
69 High Frequency Electric Currents as Used in General Practice. W. P. Glendon, Cedarville.

61.—Abstracted in THE JOURNAL, Aug. 15, 1908, p. 620.

62.—Abstracted in THE JOURNAL, Aug. 15, 1908, p. 620.

63.—Abstracted in THE JOURNAL, Aug. 15, 1908, p. 620.

California State Journal of Medicine, San Francisco.

July.

70 *Acute Otitis Media in Infancy and Childhood. H. B. Ellis, Los Angeles.
71 *Indications for the Mastoid Operation. H. Hastings, Los Angeles.
72 *Prophylaxis and Treatment of Acute Otitis Media. W. B. Stephens, San Francisco.
73 Pathology of Acute Purulent Otitis Media and Indications for Operative Interference in Acute Mastoiditis. C. F. Welty, San Francisco.

70. **Otitis Media in Childhood.**—Ellis discusses the anatomy and pathology of acute otitis media in infancy and childhood, and says that nearly all earaches which occur in the night last for a few hours and recur for a few hours for several days, are due to adenoid congestion. This condition is the cause of febrile attacks in infancy more frequently than any other disease except exanthemata. No age is too young for the recognition of adenoids and their removal prior to infection. Ellis has operated on infants a month old, but tonsils should not be operated on at this early age. The symptomatology of adenoids in infancy differs from that in childhood. The nose of the infant is relatively small and the respiratory space very small. The nasopharynx is low but deep from before backward; almost as deep as in the adult. The height increases rather rapidly for six months and then slowly up to two years. The nasopharynx is extremely vascular in infancy and the lymphoid ring is well developed. Snuffles is almost diagnostic in infancy. Adenoids frequently cause enlargement of the cervical lymph glands. Ellis holds the prejudice against early removal unjustifiable.

71. **Mastoid Operation.**—Hastings says that the factors of a timely operation may be determined by the following steps: (a) a careful otoscopic examination; (b) examination of the mastoid region; (c) the history of the case and the general signs and symptoms. He discusses these heads in detail and, in conclusion, says that a timely and thorough mastoid operation serves two distinct surgical purposes—it cleans out the mastoid, including the antrum, and in so doing efficiently drains the tympanic cavity.

72. **Otitis Media.**—Stephens enters a special plea for the recognition of the importance of acute otitis media in infancy and childhood. Many an infant has died from meningitis caused by unrecognized acute otitis media, and many a child has grown up with a discharging ear or handicapped by impaired hearing from the same cause. He calls attention, under prophylaxis, to the prominent place colds and abnormal conditions of the nasopharynx play in the etiology of acute otitis media, and, under treatment, emphasizes the value of early paracentesis and the necessity of asepsis at the time of the incision and in the subsequent treatment of the ear.

Wisconsin Medical Journal, Milwaukee.

July.

74 *The Ideal in Medicine. W. E. Ground, Superior.
75 *Purin Metabolism in Gout. H. C. Bradley, Madison.
76 Diagnosis of Renal Disease and the Determination of Renal Function with the Aid of the Cystoscope. A. G. Jenner, Milwaukee.

74.—Abstracted in THE JOURNAL, August 8, p. 523.

75. **Purin Metabolism in Gout.**—Bradley says that there seems to be no room to doubt the fact that gout can be, and is, transmitted from one generation to another—not, of course, in the acute form, for gouty symptoms are almost unknown before the age of puberty and rarely before maturity is attained—as a well-defined inclination toward the malady after the season of rapid growth and expansion has given place to the period of maturity, quiet and general prosperity. The fact that a man can so derange his own metabolism by an environment of excessive luxury as to acquire goutiness and then transfer it to his offspring seems to be of great significance. Holding stoutly to the theory that acquired characteristics are not transmitted—and this, he says, is true for the great majority of diseases, diabetes, nephritis, bacterial diseases, etc.—Bradley nevertheless says that in gout we see a disease acquired and transmitted to the next genera-

tion as a distinct predisposition toward that same disease. It seems safe, then, to assume that a disease so basic and fundamental in its attack is one which strikes at the very roots of that intricate system of change and interchange, oxidation, reduction, synthesis and cleavage that we are accustomed to lump together under the one broad name of metabolism. And yet there still remain some who consider that the uric acid commonly associated with joint inflammations is the cause of the disease itself; and, indeed, most of the measures for the relief of a patient in an acute attack are directed to the removal of the urate deposit, not to the correction of a condition which made the urate deposit possible.

Bradley then reviews in detail the work of the past few years in the way of cleaning up our understanding of uric acid metabolism in both normal and abnormal individuals, and says that in general we can assume that in the normal individual these various ferments are actively engaged in breaking down the nuclear substances. Certain of the steps go on with tremendous rapidity. In different individuals the sum total of endogenous purin metabolism will be different, because of individual idiosyncrasies, but in the same person under normal conditions it seems reasonable to suppose a rather constant nuclear metabolism, resulting in the excretion of a fairly constant amount of uric acid in the urine. This accords well with what we know of uric acid in normal urines. Granted, then, this definite mechanism for the metabolism of the cell nuclei and their peculiar proteins. It is apparent that any abnormal change in the relative or total amounts of these enzymes, or a change in the permeability of the renal mechanism, as in nephritis, will be indicated by an abnormality in the amounts of uric acid produced, destroyed and excreted in a given time. In gout we have undoubtedly such an abnormality of purin metabolism, such aspects of which have been made clear by the masterly work of Schittenhelm and Brugsch. Bradley points out that the treatment of gout, which is a derangement of metabolism, must necessarily be beyond the reach of specific drugs or rapid remedies. A faulty regimen has produced it, and only an equally persistent normal regimen can abolish it.

Montreal Medical Journal.

July.

77 Hygiene and Sanitation: Domestic, Municipal, National and International. F. Montizambert, Ottawa, Ont.
78 *Spontaneous Pneumothorax or Pneumothorax in Those Apparently Healthy. W. F. Hamilton, Montreal.
79 Opsonic Technic. A. H. MacCordick.
80 Classification of Tumors. J. G. Adami, Montreal.
81 Later History of Sleeping Sickness. J. L. Todd, Toronto.
82 Partial Auditory and Visual Aphasia with Object-Blindness Due to an Abscess of the Brain. C. K. Russel, Montreal.

78. **Spontaneous Pneumothorax.**—Hamilton reports 7 cases and finds the following common characteristics: 1. Spontaneous pneumothorax occurs in healthy individuals—mostly young men; 2. the symptoms often begin in the night or early morning; 3. there is usually no formation of fluid; 4. febrile reaction is rare; 5. the patients usually recover.

Dominion Medical Monthly, Toronto.

July.

83 *Hygiene and Sanitation: Domestic, Municipal, National and International. F. Montizambert, Ottawa, Ont.
84 President's Address, Ontario Medical Association. I. Olmsted, Hamilton, Ont.
85 Thoroughness in Abdominal Surgery. A. L. Smith, Montreal.

83. Published in the *Montreal Medical Journal*, July, 1908.

The Cleveland Medical Journal, Cleveland.

July.

86 *Obscure Fever in Infancy and Early Childhood. J. L. Morse, Boston.
87 Hypertrophied Faucial Tonsils and Adenoids an Etiologic Factor in Backward Children. H. B. Ormsby, Cleveland.
88 *Types of Paranoia. H. H. Drysdale, Cleveland.
89 *Amyl and Sodium Nitrites in Pulmonary Hemorrhage. J. Placak, Cleveland.
90 Unusual Mastoid Operations in Children. T. A. Burke, Cleveland.

86. This article was published in the *Boston Medical and Surgical Journal*, July 9, 1908, and was abstracted in THE JOURNAL, July 25, p. 347.

88. **Paranoia.**—Drysdale discusses paranoia and reports examples of paranoia religiosa, paranoia erotica, paranoia querulans, paranoia persecutoria. He adds: Paranoia is also of legal significance, and the question will arise, Should the paranoiac who knows right from wrong be held accountable for his crimes to the full extent of the law? The legal fraternity and, unfortunately, some medical men have on various occasions decided against the poor lunatic. They fail to realize that the patient lives in a world all his own, constructed by delusions which he is utterly powerless to alter. He recognizes no other law than that of heavenly origin. His crimes are the result of his hallucinations. He hears the divine voice commanding him to do his duty irrespective of the consequences, and no human agency can prevent it. In Drysdale's judgment the paranoiac with delusions of persecution and auditory hallucinations is the most dangerous individual in the community, as he is likely to become homicidal at any time. Many of the frightful tragedies that shock the public morals have been committed by persons known to be eccentric, but considered harmless.

89. **Nitrites in Hemoptysis.**—Placak has found the use of amyl and sodium nitrites in controlling hemoptysis most gratifying. They seem contraindicated in cases of erosion of a large vessel or the rupture of a small aneurism. The presence of a heart lesion seems to be no bar. The determination of the blood pressure is a valuable aid in preventing and treating hemoptysis.

Journal of Medical Research, Boston.

June.

91 Transfusion of Blood in Transplantable Lymphosarcoma of Dogs. G. W. Crile, Cleveland, and S. P. Beebe, New York.
92 Mechanism of Serum Anaphylaxis and Intoxication in the Guinea-pig. F. P. Gay and E. E. Southard, Boston.
93 Chemical Separation of Sensitizing Fraction (Anaphylactin) from Horse Serum. F. P. Gay and H. M. Adler, Boston.
94 Vaccination of Cattle Against Tuberculosis. T. Smith, Boston.
95 Cultivation of Parasitic Flagellata and Ciliata of Intestinal Tract. E. L. Walker, Boston.
96 Experimental Chronic Nephritis. W. Ophüls, San Francisco.

July.

97 Recurrent Anaphylaxis and Repeated Intoxication in Guinea-Pigs by Means of Horse Serum. F. P. Gay and E. E. Southard, Boston.
98 Relative Specificity of Anaphylaxis. Id.
99 Localization of Cell and Tissue Anaphylaxis in the Guinea-Pig, with Observations on the Cause of Death in Serum Intoxication. Id.
100 Further Study on Anaphylaxis. J. F. Anderson and M. J. Rosenau, Washington, D. C.
101 Epidermal Fibrils in Classification of Malignant Growths. G. McConnell, St. Louis.
102 Apparatus of Service in Experimental Pathology. F. P. Gay, Boston.
103 Statistics of Congenital Cardiac Disease. M. E. Abbott, Montreal.
104 Study of the Eosinophilic Cell as Occurring in the Hematopoietic Organs in Diphtheria and Tuberculosis. G. B. Foster, Philadelphia.
105 The Viability of Proteolytic Enzymes in Tissues. C. Frothingham, Jr., Boston.
106 Pseudodiphtheria Bacillus Infections and Their Response to Therapeutic Inoculations. A. P. Ohlmacher, Detroit.
107 The Reaction of Hypersusceptibility as Produced by Bacterial Inoculations. Id.
108 Papilliferous Cysts of the Kidney. J. McFarland, Philadelphia.
109 Results of Chronic Parathyroiditis as Obtained by Ligation of the Parathyroid Glandules in the Dog. R. L. Thompson and W. E. Leighton, St. Louis.
110 Pathologic Histology of the Parathyroid Glandules and a Report of a Parathyroid-like Tumor. R. L. Thompson and D. L. Harris, St. Louis.
111 Multiple Hernias of the Cerebrum and Cerebellum, Due to Infracranial Pressure. S. B. Wolbach, Boston.
112 The Colon-Aërogenes Group of Bacteria. D. H. Bergey and S. J. Deehan, Philadelphia.
113 Nature of Opsonins of Normal and of Immune Sera and Opsonic Effects Resulting from the Combined Action of Immune Body and Complement. C. H. Browning, Glasgow, Scotland.
114 Clinical and Bacteriologic Study of a Case of Pyelonephritis. D. Riesman and D. H. Bergey, Philadelphia.
115 The Forensic Value of the Musculo-Precipitin Test. F. P. Gay, Boston.

Northwest Medicine, Seattle, Wash.

July.

116 The Value of Vision in Its Relations to Accident Insurance Indemnity. H. V. Würdemann, Milwaukee, Wis.
117 Sanitation and the Physician. T. J. Sullivan, Seattle, Wash.
118 Surgical Treatment of Gastric Ulcer. F. Hinman, Spokane, Wash.
119 *Head Injuries. S. V. R. Hooker, Seattle, Wash.

119. **Head Injuries.**—Hooker calls attention to the following important facts: 1. Concussion of the brain is not a cause of death. 2. Pressure symptoms after injury to the head should mean operation. 3. Simple unconsciousness lasting more than thirty-six hours after such injury means similar treatment. 4. Such operations call for asepsis and speed more than almost any other class of operations. 5. Careful diagnosis and prognosis are necessary. Guard the latter by stating the possibility of more or less laceration of brain tissue.

Journal of the South Carolina Medical Association, Greenville.

July.

120 Ocular Tuberculin Reaction. E. W. Carpenter, Greenville.
121 Acute Bowel Obstruction. A. B. Knowlton, Columbia.
122 Ulcers. J. L. Sanders, Anderson.
123 Abortion and Its Treatment. W. H. Lawton, Vance.
124 Is Medicolegal Legislation Needed in South Carolina? W. Cheyne, Sumter.

The Laryngoscope, St. Louis.

July.

125 Essentials of Voice Production. W. Mills, Montreal, Canada.
126 Drainage Mechanism of Normal Accessory Sinuses. S. Yankauer, New York.
127 Total Deafness Following Infectious Diseases. L. J. Goldbach, Baltimore.
128 Intracranial Complications of Suppurative Otitis Media. J. J. Thompson, New York.
129 Case of Extradural Abscess. C. P. Jones, Newport News, Va.
130 Three Cases of Laryngeal Growth Removed by Direct Laryngoscopy. J. McCoy, New York.
131 Congenital Diaphragm of the Larynx. G. Klaer, Copenhagen, Denmark.
132 Congenital Detachment of Faucial Pillars and Isolation of Palato-Glossus Muscle. P. Fridenberg, New York.
133 Three Unusual Cases of Nasal Disease. G. C. Hall, Louisville, Ky.

Memphis Medical Monthly.

July.

134 Medical Evolution. H. Hawkins, Jackson, Tenn.
135 Pathogenesis of Pernicious Malaria. W. H. Deaderick, Marianna, Ark.
136 Bier's Stasis Hyperemia in Acute Inflammations. J. H. E. Rosamond, Memphis.
137 Two Cases of Accidental Antepartum Hemorrhage. O. S. McCown, Memphis.
138 Administration of Quinin by Inunctions. G. E. Petty, Memphis.
139 Plastic Surgery of the Face. J. E. Johnson, Memphis.
140 Impressions from the Fifty-ninth Meeting of the American Medical Association. O. S. McCown, Memphis.

Albany Medical Annals, Albany.

July.

141 Character of the State Board Examinations and the Competency of State Medical Examining Boards. W. G. Tucker, Albany.
142 The Guest or Personal Experiences of a Patient in a Hospital Told by Herself (Continued).

Denver Medical Times, Denver.

July.

143 Reminiscences. J. Elsner, Denver.
144 Influenza. L. P. Barbour, Rocky Ford, Colo.
145 Travel Observations. L. R. Hopkins, Denver.

Utah Medical Journal, Provo.

July.

146 Relations That Should Exist Between the Medical Profession and the General Public. H. D. Niles, Salt Lake City.
147 The Teeth—Deformities: Causes, Prevention and Treatment. O. K. Hansen, Provo.

American Practitioner and News, Louisville.

July.

148 Life Insurance Medical Examination. W. E. Grant, Louisville.
149 Continuous Rectal Irrigation. G. S. Hanes, Louisville.
150 Pulmonary Tuberculosis. J. W. Irwin, Louisville.

Journal of Experimental Medicine, New York.

July.

151 Pathologic Anatomy of Hydrazine Poisoning. H. G. Wells, Chicago.
152 Melanoma of Vater's Diverticulum and Lower Portion of Common Bile Duct Causing Complete Obstruction. C. W. Duval, Montreal, Canada.
153 Biologic Study of the Cerebrospinal Fluid in Anterior Poliomyelitis. M. Wolfstein, New York.
154 Pulse Pressure as an Index of the Systolic Output. P. M. Dawson and L. W. Gorham, Baltimore.
155 Return of Function in the Central Nervous System After Temporary Cerebral Anemia. F. H. Pike, C. C. Guthrie and G. N. Stewart, Chicago.
156 Ratio Between Heart Weight and Body Weight in Various Animals. D. R. Joseph, New York.
157 Production of Agglutinins in the Animal Body by Inoculation of Substances Other Than Products of Bacterial Origin. K. R. Collins, New York.
158 Differential Counts of Cells in the Lymph of the Dog: Their Bearing on Problems in Hematology. F. P. Rous, Ann Arbor.
159 Obstructive Hydrocephalus Following Cerebrospinal Meningitis, with Intraventricular Injection of Antimeningitis Serum (Flexner). H. Cushing and F. J. Sladen, Baltimore.
160 Glycothionic Acid. P. A. Levene and W. A. Jacobs, New York.
161 Human Spleen as a Hematoblastic Organ, as Exemplified in a Case of Splenomegaly with Sclerosis of Bone Marrow. J. L. Donhauser, Philadelphia.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

Lancet, London.

August 8.

1 *Intrathoracic New Growths. T. R. Glynn.
2 Human and Cattle Tuberculosis: Investigations of 97 Norwegian Farms. B. Overland.
3 *Treatment of Appendix Abscess. A. W. Cuff.
4 Use of Selected Lactic Acid Bacilli and Soured Milk in Treatment of Some Forms of Chronic Ill Health. G. Herschell.
5 Case of Diphtheria and Impetigo Contagiosa in a Child. T. P. Puddicombe.
6 Experiments as to the Constancy of the Carbohydrate Reactions of the Streptococci. J. Ritchie.
7 *Organism Discovered in a Case of Epidemic Diarrhea. R. S. Williams, J. Orr, H. L. Murray, C. Rundle and A. E. Williams.

1. **Intrathoracic New Growths.**—Glynn bases his observations on 23 cases of intrathoracic growths, in which postmortem examinations were held. In sixteen cases the tracheobronchial glands were the seat of the new growth. He describes the arrangement of these glands in groups, and says that it is evident that a malignant infection originating in any gland of the tracheobronchial system is likely to extend from group to group. Malignant growths in the esophagus, vertebræ, breast or sternum may cause secondary disease of the glands or may invade the mediastinum, the pleura or lungs by continuity. Glynn discusses the various forms of new growth that may affect the mediastinum. Pleuritis effusion frequently complicates intrathoracic malignant growths. Little or nothing can be said of the cause of the growth. The symptoms of growth in or hypertrophy of the bronchial glands are due largely to pressure on or invasion of nerves, bronchi, vessels, etc. Glynn can find no record in his cases of the "aching constrictive pain" referred to the upper part of the chest behind the sternum, which Rendu says generally precedes other symptoms. Dyspnea is frequently present and was a prominent symptom in two of his cases of cancer of the lungs. Hoarseness is common, from pressure on the pneumogastric or recurrent laryngeal nerve. Cough is present at some period. The quantity and character of the expectoration may vary exceedingly, being dry, streaked with blood, or purulent. Hemoptysis may be present in malignant disease and more or less pyrexia is to be expected in Hodgkin's disease. Constriction of a main bronchus from pressure is likely to give rise to characteristic signs. These he discusses at length. The diagnosis of mediastinal tumor is often difficult, and the prognosis is necessarily unfavorable, though he has noted two cases, presumably of mediastinal growth, in which the course was not unfavorable. Arsenic in increasing doses is indicated in enlarged mediastinal glands with Hodgkin's disease; and potassium iodid is indicated if syphilis is present. Otherwise, the treatment is palliative. Hypodermic injection of atropin may relieve pain.

3. **Appendix Abscess.**—Cuff suggests that the operative treatment of appendix abscess should conform as much as possible to the following propositions: The abdominal route should be chosen in all cases. The incision should be so placed as to allow of the easiest access to the origin of the mischief, and it should be so large and so capable of extension that any conditions likely to be found may be dealt with easily and thoroughly. Ease of manipulation means quickness of operation, and this quickness is essential in dealing with these half-poisoned patients. A second operation should not be done if it can possibly be avoided, hence the appendix

should always be removed at the same time. There should be as little mutilation as is compatible with thoroughness, two incisions not being made when one properly placed at first will do all that is necessary. Drainage tubes, both in size and in number, should be reduced to a minimum. The abdomen should not present the appearance of a target stuck full of arrows, as in the illustrations of some suggested procedures. It should always be borne in mind that tubes leave very weak places in the scar, as well as being liable to injure the peritoneum, and so predispose to intestinal obstruction from the formation of adhesions with the bowels. Injury to the nerve supply and to muscular fibers should be avoided when possible, and the wound and its resulting scar should be placed in as strong a part of the abdominal wall as is compatible with the foregoing requirements.

7. **Epidemic Diarrhea.** Williams, Orr and others, after examining the feces in the cases of epidemic diarrhea in Liverpool City Hospital, report the constant finding of an organism closely related to the *B. paratyphoid* group which produces diarrhea in young puppies. Its relation to epidemic diarrhea is the subject of investigation at present.

British Medical Journal, London.

August 8.

8 *Treatment of Some of the Severer Forms of Headache. W. Harris.
9 *Value of Diminished Cardiac Dulness in Diagnosis of Cancer. W. Gordon.
10 Case of Streptococcic Puerperal Infection Treated with a Vaccine. G. W. Crowe and W. H. Wynn.
11 *Dangers of Calmette's Ocular Reaction. T. H. Butler.
12 Training of Teachers in Personal and School Hygiene. C. C. Douglas.
13 *Influence of Alcohol in the Services. A. M. Davies.
14 Feeding of Soldiers in Barracks, in Hospitals, and in War. R. J. Blackham.
15 Alcohol as a Cause of Inefficiency. G. S. Crawford.
16 Importance of Learning a Trade in the Army. W. V. Sinclair.
17 Dust and Disease. E. Owen.

8. **Headache.** Harris, for practical purposes, classifies headaches and discusses them as follows:

A. Superficial.
1. Diseases of the Brain Coverings:
(a) Scalp—e. g., cellulitis; weight of hat or mass of hair.
(b) Pericranium—e. g., rheumatic.
(c) Bone—e. g., tuberculous or syphilitic caries.
2. Reflex Visceral Neuralgias of Scalp:
Ocular, dental, pulmonary, cardiac, gastric, etc.

B. Deep.
3. Reflex Cortical Neuralgia:
Visual "Academy" headache; thunderstorm; neurasthenic.
4. Toxemic:
Constipation and sluggish liver; influenza and other fevers; foul air; alcohol; ether.
5. Increased Intracranial Pressure:
Cerebral tumor and abscess; acute encephalitis; hydrocephalus; cerebral hemorrhage; cerebral edema in chlorosis and arteriosclerosis; sinus thrombosis; meningitis; tight neckband; migraine; epilepsy.

He points out how unsuccessful we are in relieving true migraine by ordinary antineuralgic remedies. He believes this to be because the pain in migraine is produced by an increase of the intracranial pressure brought about in the first instance by arterial dilatation of certain cortical and meningeal areas—a vascular dilatation which succeeds the primary vasomotor constriction which surely occurs in this disease. He believes that the operation of trephining, which has been done several times for neurasthenic headaches, would be justified also in those severe cases of frequently recurrent migraine in which the unfortunate patient is prostrated for one or more days every week or so.

9. **Cardiac Dulness and Cancer.** Gordon refers to a previous paper in which he described a diminution of the cardiac dulness in the recumbent posture occurring in some cases of cancer, and suggested its probable value in diagnosis. He now states that further experience has justified this view, and tabulates, with brief reports, 103 cases, all of such a nature as to raise in greater or less degree the suspicion of cancer, while in all of them the reduction of the dulness or the absence of reduction could not be fairly accounted for by ordinary causes. He defines diminished cardiac dulness as follows: With a patient completely recumbent—that is essential—a normal cardiac dulness generally begins at about the third costal cartilage, has its right limit about the mid-sternum, and measures about three inches across at the level of the fifth costal cartilage; but in the condition discussed here the dulness begins above about the fourth costal cartilage, has its right limit a little to the left of the left sternal border, and measures across, at the level of the fifth costal cartilage, less than two inches, or in many cases less than one inch; sometimes there is no cardiac dulness at all. With this diminution of obliteration of dulness are often associated a small feeble low-tension pulse and weak heart sounds. He divides his cases into three classes: Class 1 (38 cases) included cases in which a presumable cancer was naturally accessible to direct examination or was examined at operation or postmortem; diminished cardiac dulness was shown in 34, or 89 per cent. Class 2 (19 cases) consisted of cases which all ended fatally, the downward course according with the diagnosis of cancer; diminished cardiac dulness was present in 17, or almost 90 per cent. Class 3 (46 cases) consisted of cases which for various reasons can not be supposed to have been cancerous; diminished cardiac dulness appeared in only 11, or 24 per cent. An important question is as to the stage in the development of cancer at which diminished dulness appears. Gordon considers the time hardly ripe for explanation of this phenomenon, but suggests tentatively that in cancer the heart, like other muscles, may become more flaccid, or that the lungs, like the abdominal skin, may lose some elasticity, and so give rise to a spurious emphysema; or finally, that in many cases of cancer the heart is known to become much reduced in size.

11. **Ocular Tuberculin Reaction.** Butler reported in May, 1908, conclusions based on certain cases to the effect that the reaction, though sometimes obtained in the non-tuberculous and sometimes absent in the certain tuberculous cases, was at any rate devoid of danger to the healthy eye. He now reports, however, that three of the patients on whose cases he based this view, have done badly. In one case, a typical tuberculous process was set up in a perfectly normal eye and the central nebula will considerably reduce the visual acuity of the eye. He has therefore abandoned the method, and considering that it is often deceptive and may do great damage he holds its use unjustifiable.

13. This article is commented on editorially.

Medical Press and Circular London.

August 5.

18 Various Methods Employed in Serodiagnosis of Syphilis. Professor Fornet.
19 *Vermin as Disease Carriers. L. W. Sambon.
20 Artificial Respiration. J. P. C. Kirkpatrick.
21 Food Inspection at Ports of Entry. W. F. Dearden.
22 Baths of Schluznach, Switzerland. H. Sewill.

19. **Vermin as Disease Carriers.** Sambon, after referring to the fact that both mammalian and avian tuberculosis are transmissible to man, states that he has recently investigated two severe epizootics among birds, and has found the pneumonia diplococcus exactly like that in the human being. The facts have convinced him more than ever of the necessity for the study of epizootology, with a view to the elucidation of the epidemiology of our own diseases and scourges. Fatal enteritis may cause deadly epidemics in man. Prophylaxis is futile unless every single factor in the epidemiology of each disease is considered. Pigeons probably play a disseminating rôle in diphtheria, and he has a strong suspicion also of the sparrow, for in it he has found both tuberculosis and diphtheria. He had not time to discuss the part played by the dog and the cat in the spread of disease. He regards the mouse as one of the deadliest of household pests. The majority of diseases known to be insect-borne are tropical, because the diseases of the tropics have been investigated by men unbiased by preconceived ideas. Sambon declares that in the matter of prophylaxis we of the present day are pygmies compared with the ancients. He quotes a number of instances from Roman and Greek his-

tory, showing the measures of precaution adopted and the accuracy with which the onus of the spread of disease was placed on certain animals, in classical times.

Clinical Journal, London.

August 6.

22 *Treatment of Tapeworm. F. de H. Hall.
24 Injuries to the Head. A. A. Bowlby.
25 Constipation. A. F. Hertz.

23. **Tapeworm.**—Hall describes the indications in the treatment of tapeworm and says that they are all met by the following plan, originally described by the late Dr. Leslie Ogilvie, which he has found to answer in every case in which he has tried it: For three days previous to the administration of the male fern the patient should be kept entirely on a liquid diet; a pint and a half of milk and a like quantity of beef tea answer very well. To promote a free action of the bowels and to favor the removal of mucus, twenty grains (gram 1.30) of sodium bicarbonate, a dram of sodium sulphate, and twenty minims (gram 1.12) of spirit of chloroform in an ounce (gram 30.) of peppermint water, should be taken three times a day. The night before the male fern is given the patient should have half an ounce (gram 15.) of magnesium sulphate, with a dram of tincture of jalap, and twenty minims (gram 1.12) of the compound tincture of chloroform in an ounce (gram 30.) of water. This is repeated next morning at 7 o'clock if the previous dose has not operated. At 8 a. m. a dram (gram 4.0) of the liquid extract of male fern, made up in a mixture with a dram (gram 4.0) each of mucilage of tragacanth and syrup of ginger in an ounce of chloroform water. At 9 a. m. this dose should be repeated. At 11 a. m. half an ounce (gram 15.) of castor oil with a dram (gram 4.0) of tincture of jalap should be given, and if the bowels do not act within an hour an enema of a pint and a half or two pints of soapy water should be administered. The motions should be carefully examined to find the head, and if the above treatment has been faithfully carried out it may be sought for with confidence. It is desirable to keep the patient in bed for two or three hours after the bowels have acted, as the male fern may cause faintness.

British Journal of Children's Diseases, London.

July.

26 *Pneumonia in Childhood. T. R. Whipham.
27 Case of Pneumococcal Peritonitis with an Unusual Complication. H. S. Clegg.
28 Edema Persisting since Birth. G. A. Sutherland.

26. **Pneumonia in Childhood.**—Whipham states that pneumonia is one of the common affections of childhood. When a child has pneumonia, it is a common error to imagine that it must of necessity have lobular or bronchopneumonia. Such is by no means always the case. The lobar variety of pneumonia is much more frequent in childhood than is often supposed. The diagnosis between lobar pneumonia and bronchopneumonia is often a matter of some little difficulty. The chief points of distinction to be borne in mind are: 1, Lobar pneumonia is almost always primary, while bronchopneumonia is frequently secondary; 2, its onset is sudden and the symptoms well marked, whereas bronchopneumonia begins insidiously as a rule; 3, the temperature in lobar pneumonia tends to be more uniformly high and to end by crisis, whereas, in the other form the course of the fever is prolonged and irregular, and rarely ends abruptly; 4, lobar pneumonia usually affects a localized area of one lung, at any rate to begin with, the signs being limited to that area and leaving the rest of the lung free, while bronchopneumonia is bilateral and more extensive; 5, bronchopneumonia tends to occur at a slightly earlier age than lobar pneumonia. In lobar pneumonia, the male sex is the one that is chiefly affected in childhood, as in adult life, and the disease may occur at any age. In Whipham's series the right lung was affected in 37 cases, or 56.9 per cent.; the left in 23, or 35.3 per cent., and both lungs in 5 cases, or 7.8 per cent. It is of general knowledge that the right lung is more often affected than the left, but in these cases the incidence on that side was rather more frequent than appears usually to be the case. The onset of lobar pneumonia is almost invariably sudden. In Whipham's series the disease terminated in a definite crisis in 44 out of the 54 cases, or in 81.4 per cent., in which the termination of the pneumonic process could be accurately determined. In the majority of cases, the crisis took place, between the fifth and tenth days, during which period it occurred in 30 instances, or 68.1 per cent. A few cases terminated by crisis as early as the third or fourth day. The temperature in children often tends to vary considerably between wide extremes, a high temperature alternating with a normal or subnormal one. In the series of 65 cases 11 patients died, giving a total mortality of 16.9 per cent.

Bronchopneumonia in childhood is more particularly a disease of early infancy. In Whipham's 85 cases the sexes were affected equally. His series consisted of 33 primary and 52 secondary cases. The lesions of bronchopneumonia are to be found, as a rule, simultaneously in both lungs. In the greater number of cases the disease begins insidiously, and this is especially the case in the secondary form. Speaking generally, the temperature in bronchopneumonia is not so high as in the lobar form and is less regular, the remittent or intermittent type being more or less characteristic. The duration of the fever was found to vary considerably. The temperature subsides gradually in nearly all cases—in other words, a crisis seldom occurs. Whipham had a total of 39 deaths in his 85 cases, or a mortality of 45.9 per cent. Bronchopneumonia complicating measles has a bad prognosis, and is closely followed by that associated with whooping cough and a previous bronchitis. During the first two years of life the mortality is high. A sudden onset of the disease in primary cases appears to be of unfavorable import. The temperature also affords some indication of the virulence of the infection, hectic temperature with high maxima having an especially bad prognosis. Such cases are generally due either to a streptococcal or a mixed infection.

Australasian Medical Gazette, Sydney.

June 20.

29 Present Views of the Nature of Tuberculosis and Its Treatment by the Physician. C. Reissmann.
30 Impacted Shoulder—Tonic-Contraction of the Uterus—Removal of Uterus and Contents by Panhysterectomy. R. Worrall.
31 Uses of Bozzi's Dilator in the Artificial Dilatation of the Os Uteri in Labor. J. L. T. Isbister.
32 Antepartum and Postpartum Hemorrhage. F. Barrington.
33 *Disturbances of Menstruation. W. T. Chenhall.
34 *Extensive Syphilitic Necrosis of the Skull, Illustrating an Easy Way for Removing Such Sequestra. T. Fiaschi.

33. **Menstrual Disturbances.**—Chenhall discusses amenorrhea, vicarious menstruation, imperfect development, menorrhagia and metrorrhagia. He says:

"Since sterility and dysmenorrhea are due to various causes, treatment must necessarily be varied in character. In the absence of painful menstruation, operation is only permissible for sterility when some morbid hyperemia or congestion of the mucosa prevents proper engrafting of the ovum. In absolute or relative amenorrhea with sterility it is justifiable to dilate the uterine canal for the purpose of applying the negative pole of the galvanic current to restore menstruation. Proof of the husband's potentiality should precede operation on the wife. The gynecologist's duty is to establish normal menstruation and potential fertility, hence it is useless and unwarrantable to establish hopes of fertility by cervical dilatation when tubal occlusion renders conception impossible. Medicinal treatment is irrational when alone directed toward relief of pain. Stimulants, anodynes and narcotics damage the constitution, inculcate vicious habit and introspection, and lead, ultimately, to complete moral perversion and degradation." In regard to versions and flexions, he says that unwarranted prejudice against pessaries now exists.

34. **Sequestra in Syphilitic Necrosis.**—Fiaschi reports a case of a man, aged 46, with a large piece of necrosed bone in the forehead. He describes its removal, and on the basis of this experience he urges surgeons who may meet with similar cases not to trouble to trephine or chisel through the peripheral thickened and eburnated healthy bone, but to attack boldly, with a common saw, the necrosed bone, following four or five lines which will include the chief area of it then

to introduce one or two thin steel chisels through the saw lines and prize up the sequestrum. The fringes of the necrosed bone adherent to the sound will be easily detached from inside outward, either with rongeur or w[illegible] sequestrum forceps.

Intercolonial Medical Journal of Australasia, Melbourne.

June 20.

35 Surgical Treatment of Exophthalmic Goiter. T. P. Dunhill.
36 Urinary Infection in Infants. H. D. Stephens.
37 Plea of Insanity, Monomania, or Partial Insanity. W. Beattie-Smith.
38 Hypertrichosis and Port-Wine Marks, Involving Both Sides of the Face, Removed by X-Rays. T. G. Beckett.

Annales de Dermatologie et de Syphiligraphie, Paris.

July, IX, No. 7, pp. 385-561.

39 Pulverized Metallic Zinc in Treatment of Ulceration on the Genitals. L. Kopytowski.
40 Septicemia from the *B. Pyocyaneus*, and True Chronic Bullous Pemphigus. G. Petges and H. Bichelonne.
41 Histologic Modifications Engendered in Cutaneous Affections by an Intercurrent Febrile Infection. (Dermatite polymorphe douloureuse et pneumonie.) J. Pellier.

Archives Générales de Chirurgie, Paris.

July 25, II, No. 7, pp. 1-111.

42 *Condition of the Glands in Cancer of Testicle. R. Grégoire.
43 *Hydatid Cysts of the Spleen. (Kystes hydatiques de la rate.) A. Martin.
44 *Two Cases of Milky Ascites. (Ascite chyliforme.) Mauclaire.

42. **The Glands in Cancer of the Testicle.**—Grégoire reports three cases and reviews five others—this material showing that it is impossible to determine the condition of the glands with cancer of the testicle in any way except by an exploratory operation. Neither the duration of the affection, the size of the growth or palpation gives any reliable data in respect to the state of the glands. They are liable to be extensively involved early. Simple castration is not rational treatment in these cases. Three of the patients in the cases mentioned were in good health when last seen some time after the operation.

43. **Hydatid Cysts of the Spleen.**—Martin adds 6 unreported cases to the 83 he had previously collected, and reviews the origin, pathologic anatomy and the symptoms. The latter differ as the cyst develops up or down, and toward the front or rear. Simple puncture is unreliable and exposes to severe immediate or later disturbances. Simple extirpation should be done only in case the cyst is pedunculated and suppurating. Splenectomy should be the rule in case the spleen presents multiple cysts, not suppurating. The only drawback is the seriousness of the operation. If the cyst is suppurating and adherent, the only treatment is by incision, suturing the lips of the cyst to the lips of the wound—marsupialization—and drainage.

44. **Milky Ascites.**—Mauclaire reports a case of chyliform ascites with carcinomatosis of the peritoneum, and also a case in which the chyliform ascites accompanied tuberculous peritonitis. He reviews the literature on the subject, tabulating the various causes for this condition.

Bulletin de l'Académie de Médecine, Paris.

July 21, LXXII, No. 29, pp. 78-103.

45 Various Routes of Secondary Propagation of the Treponema Pallidum, Their Influence on the Symptoms, and Necessity for Arresting the Treponema *en route*. (Voies de propagation secondaire du Treponema pallidum et la possibilité d'y mettre obstacle par un traitement local atoxyliен.) H. Halloppeau.

July 28, No. 30, pp. 105-162.

46 *Septicemic Phthisis. L. Landouzy and L. Laederich.
47 Immunization by Revaccinations. (L'immunité et l'immunisation vaccinales dans leurs rapports avec la voie de pénétration du virus.) Kelsch, Camus and Tanon.

46. See No. 48.

Presse Médicale, Paris.

July 29, XVI, No. 61, pp. 481-488.

48 *Subacute Form of Tuberculous Septicemia. L. Landouzy and L. Laederich.
49 *Practical Value of Percutaneous Tuberculin Reaction. E. Moro.

August 1, No. 62, pp. 489-496.

50 General Principles Regulating the Blood Pressure. (Pression sanguine et ses variations à l'état normal.) G. Weiss.
51 Internal Secretions and Psychoses. Laignel-Lavastine.

August 15, No. 63, pp. 497-512.

52 *Simple Mitral Stenosis and Dwarf Growth. (Rétrécissement mitral pur et nanisme.) M. Labbé.
53 *Viscosity of Blood and Iodin. (Viscosité du sang et iode.) P. Bovéri.
54 *Measles and Red Light. (Rougeole et la lumière rouge.) F. Simionescu.

48. **Septicemic Form of Acute Miliary Tuberculosis.**—Landouzy and Laederich give an illustrated description of a case of acute miliary tuberculosis assuming the form of a subacute septicemia. The toxi-infection ran its course with a series of exacerbations, each one causing local reactions of variable location and type. Successively and alternately manifestations on the part of the joints, skin, heart, pericardium, endocardium, lungs and pleura predominated in the clinical picture; but the general symptoms, the continuous fever, emaciation and wasting testified to the toxic impregnation of the organism. The patient was a groom of 16, and he died in less than three months of the toxic infection, although scarcely "tuberculous" in the sense of pathologic anatomy. Except for one small miliary tubercle in the lung, none of the tissues had reacted to the bacillary toxi-infection except with the manifestations of ordinary non-specific inflammation. The authors think that this and similar cases which they have observed should be regarded as a new type of acute miliary tuberculosis distinct from the meningeal, the pulmonary and the typhoid forms. They emphasize the way in which the field of tuberculous infection is being enlarged to include many affections involving the pleura, the heart, joints, skin, etc. In the case described, the joint affection, the polymorphous erythema and the endopericarditis were accompanied by tender, recurring lumps on the elbows and skull, vanishing completely in less than a month.

49. **Percutaneous Tuberculin Reaction.**—Moro here recapitulates his work in this line. He uses a salve containing six parts of Koch's old tuberculin to five parts of lanolin. A piece about the size of a pea is lightly rubbed for half a minute on the skin of the abdomen or chest, with care not to injure the skin. The reaction, if positive, occurs on the surface of the skin, as a folliculitis—the "percutaneous reaction;" in 24 or 48 hours from one to ten pale papules appear on the surface. In case of a negative reaction the skin shows no change.

52. **Mitral Stenosis and Dwarf Growth.**—Labbé reports a case in a young man of this combination. He discusses the question from various points of view, and is inclined to believe that inherited syphilis and tuberculosis were the primary cause of both the valvular lesion and the defective growth.

53. **Viscosity of the Blood and Iodin.**—Bovéri has been studying the subject on twelve patients with hypertension from various causes, and his findings show that the blood becomes more viscous with arteriosclerosis and advancing years. Treatment with iodids renders the blood more fluid in inverse proportion to the severity of the case. This explains one of the causes of the favorable action of iodin in cardiovascular affections. When one reflects how the urine passes through the long and tortuous renal tubules, and other secretions through capillary systems, while the lymph and the blood have to circulate through extremely delicate capillaries, it is easy to see what an important factor for the proper nourishment of the tissues, etc., is the more or less viscous condition of the blood. It may be a determining element in the complex mechanisms of circulation and excretion.

54. **Measles and Red Light.**—This communication from Bucharest extols the advantages of keeping patients with measles under the influence of red light. It relates two cases showing the different course of the disease in two brothers, one of whom had a room with red walls and curtains. The influence of the red light seems to abort the infection, the measles germ and its toxin apparently losing their pathogenic properties under the action of the red light.

Archiv für Kinderheilkunde, Stuttgart.

XLVIII, Nos. 3-4, pp. 161-320. Last indexed July 4, p. 82.

55 *Increase of Proportion of Fat in Breast Milk During Ingestion of Fat. (Fettvermehrung der Frauenmilch durch Fettzufuhr.) L. Moll.

56 Importance of Different Proportions of Fat in Breast Milk in Respect to the Thriving of the Infant. (Bedeutung der quantitativen Fettunterschiede für das Gedeihen des Brustkindes.) Id.
57 *Tendency to Spasm in Children and Lime Metabolism. (Spasmophilie und Calcium.) H. Risel.
58 Emphysema in Skin as Accident from Intubation. (Hautemphysem als Intubationstrauma.) F. Hamaes.
59 *Scarlatinal Joint Affections. (Scharlachrheumatismus.) G. E. Wladimiroff.
60 *Bronchial Asthma in Children. J. S. Arkawin.

55. **Influence of Ingestion of Fat on Breast Milk.**—Moll found that the amount of fat in the milk of a thin wet-nurse could be increased to twice its former proportions by having her eat bacon freely twice a day. The child she was nursing thrived notably on the fatter milk, the former dyspeptic stools becoming normal. Experiments with other wet-nurses confirmed the benefit from allowing plenty of bacon when a child is not thriving on a fat-poor breast milk. Certain facts observed seem to suggest that the milk fat of different wet-nurses is not identical, which compels caution in changing. It may be advisable to use a milk sometimes containing still less fat for a time.

57. **Calcium and Spasmophilia.**—Risel has examined twenty-two children with more or less signs of spasmophilia from nutritional disturbances or rachitis. He added to their milk or gruel a 3 or 5 per cent. solution of calcium acetate. The results showed very little influence from the calcium on the tendency to convulsions. The electric excitability of the peripheral nerves was not increased, but rather diminished, as also the spasmophilic tendency.

59. **Scarlatinal Joint Affections.**—Wladimiroff's experience has shown that neuritis occurs after many acute infectious diseases, and he describes some cases in which this seems to be the explanation of the scarlatinal rheumatism observed. The complication may assume the form of a serous synovitis or of a neuritis. In the latter the joint does not usually swell, although there may be edema, but the pain may extend through the entire limb and be variable in character and intensity. If the vagus and phrenic nerves are affected in the same way, and if anatomic changes are found in scarlet fever such as he has encountered in diphtheria, this will throw light on the early fatal cases of scarlet fever. He adds that the anatomic changes in the nerves in scarlet fever and the nervous complications should be more carefully studied. The salicylates proved useful in his experience with this scarlatinal polyneuritis. In one case ataxia followed scarlet fever.

60. **Bronchial Asthma in Children.**—Arkawin reports 10 cases in children from 17 months to 12 years old, and reviews the literature. He believes that asthma may occur as an independent, essential affection and as a symptomatic affection from reflex action. Catarrhal manifestations were pronounced in all his cases, only two of which seemed to be of the symptomatic form.

Beiträge zur Klinik der Tuberkulose, Würzburg.

X, No. 1, pp. 1-130. Last indexed June 20, p. 211).

61 Opsonic Index and Tuberculosis. K. Turban and G. Baer.
62 *New Points of View in Tuberculin Therapy. (Neue Gesichtspunkte in der Tuberkulintherapie.) D. Rothschild.
63 Concrements in the Lungs and Treatment with Silicic Acid. (Lungensteine und Kieselsäurebehandlung.) H. Gerhartz and A. Strigel.
64 *Tuberculin Treatment of Pulmonary Tuberculosis from Clinical Standpoint. (Tuberkulinanwendung in der Lungentuberkulose vom klinischen Standpunkte.) K. Dluski.
65 *Roentgen-Ray Inspection of Thorax in Dyspneic Patients. (Zur Röntenographie des Thorax dyspnoischer Patienten bei Atemstillstand.) A. Rzewuski.

62. **Autotuberculin and Opsonic Index.**—Rothschild lays down various rules for improving the technic of tuberculin treatment of pulmonary tuberculosis. The correct dose of tuberculin seems to be, he says, the smallest dose which causes a pronounced rise in the opsonin content of the blood. The opsonic index is an exact guide for tuberculin treatment, but it gives contradictory findings sometimes. It is possible, he declares, to eliminate the causes for these discrepancies by using as the tuberculin an emulsion of tubercle bacilli derived from the patient's own sputum, urine or any disease product of the patient himself. The phagocytosis must be tested with the patient's own bacilli to insure absolutely reliable findings. The logical consequence is that each patient should have his own individual tuberculin—a bacilli emulsion made with his own bacilli. This autotuberculin is specific, he asserts, in the truest sense of the term, and the opsonic index conforms to it constantly. He has applied this autotuberculin in three cases and was impressed with the superior curative results obtained with this "ideal form of tuberculin treatment." He never surpassed the dose of 1/500 mg., but each inoculation was followed by a brief negative phase of the opsonic index, succeeded by a pronounced and prolonged positive phase. When the opsonin content of the serum begins to decline, another inoculation is made—the intervals ranging from two to four days. These small doses always displayed a distinct influence on the opsonic index, and induced marked improvement in the subjective and objective condition. He adds that in cases of mixed infection vaccines should be used against the other infectious germs, to supplement the tuberculin treatment. For this also he recommends inoculation of killed cultures of germs cultivated from the sputum or pus of the patient in question. Autotuberculin treatment under the control of the opsonic index promises to solve the question as to the dosage and intervals of the injections. Of course, artificial inoculation of an emulsion of tubercle bacilli is necessary only when the opsonic index is too low. In certain cases of tuberculosis the opsonic index is very high, and he agrees with Wright that in these cases there is a continuous or constantly repeated autoinoculation of the blood with bacilli and bacillary products from the vicinity of the focus. This keeps the opsonic index high. In all such cases artificial tuberculinization is purposeless. On the contrary, every effort should be made to prevent too energetic autotuberculinization, protecting the patient by complete bed rest or restriction of unnecessary movements. If the bacillary toxins overwhelm the organism too much, the changes in the opsonic index are accompanied by severe subjective disturbances. The fever curve has no direct relation to the opsonin content of the blood, yet the maximal temperature after too large doses of tuberculin seems to correspond always with the lowest point of the negative phase of the opsonin curve following the inoculation. In cases in which it is impossible to obtain any bacilli from the patients, he uses an emulsion of mixed bacilli—a universal tuberculin—which contains as many different kinds of acid-proof bacilli as possible, both the bovine and human types. This does not supply an absolutely specific autotuberculin, but comes nearer to it than any of the ordinary preparations now in use. The simultaneous inoculation of a number of varieties enhances the probability that one of them is of the patient's own type. The endogenous autotuberculin accumulated in the periphery of the disease focus can be forced into the blood by systematic graduated movements, and thus, by artificial means, the opsonin content of the blood can be increased. In this way it is possible to utilize therapeutically the endogenous autotuberculinization by a rational succession of periods of rest and work. He applies the term exogenous autotuberculin to that produced outside of the body by an emulsion of the patient's own bacilli.

64. **Tuberculin Treatment of Pulmonary Tuberculosis from the Clinical Standpoint.**—Nearly a hundred pages are devoted by Dluski to a review of the clinical results of tuberculin treatment of tuberculosis in two dozen different sanatoria. This gives an oversight over more than 1,743 cases of tuberculosis under tuberculin treatment, and nearly 8,000 cases in which tuberculin was injected for diagnostic purposes. Fully 229 articles on the subject have been consulted, and he tries to reconcile the conflicting views of those who are warm advocates of tuberculin treatment and those prejudiced against it. He considers individually the results with the different varieties of tuberculin—eight in all. The article is a comprehensive summary of what has been done in this line of specific treatment of tuberculosis during the last seventeen years. Several tables give an oversight of the details of the technic followed in each sanatorium. His final conclusions are that the combination of hygienic and dietetic measures with tuberculin gives no better results, on the whole, than the hygienic-

dietetic measures alone. Science has not yet formulated laws for specific treatment with tuberculin. Instead of this, we have merely the personal impressions of single physicians either for or against tuberculin treatment. The clinic teaches that the tuberculins may have a very favorable action in very severe cases, but, on the other hand, they may develop injurious and even dangerous action in mild cases. Specific treatment should be applied only with extreme caution, he warns. The safest technic, he is convinced, is that of Hammer and Sahli, as this seems to avoid all possible complications. At present, however, he declares that chaos still reigns in regard to the application of tuberculins in therapeutics.

65. **Roentgen Ray Inspection of Thorax of Dyspneic Patients.**—Rzewuski has found it possible to obtain very fine skiagrams while the patient is holding his breath, by having the patient breathe pure oxygen just before the exposure. This enables him to hold his breath much longer than usual.

Berliner klinische Wochenschrift.

August 3, XLV, No. 31, pp. 1433-1476.

66 *Plastic Restoration of Traumatic Defects of Ear. (Plastische Ersatz von traumatischen Defekten der Ohrmuschel.) V. Schmieden.
67 *Relations between Adrenal System and the Kidneys. (Beziehungen zwischen Adrenal-System and Niere.) K. Reicher.
68 *"Sphincteric Proctitis." H. Strauss.
69 Experimental Study of Keating-Hart "Fulguration" of Vital Organs. G. Arndt and A. Laqueur.
70 Importance of Ultramicroscopy for Clinical Study. (Verwendbarkeit der Dunkelfeldbeleuchtung in der klinischen Mikroskopie.) C. Posner. Id. (Bedeutung der Dunkelfeldbeleuchtung für Blutuntersuchungen.) A. Dietrich.
71 Action of Hydrochloric Acid on Secretion of Ferments in the Stomach and Pancreas. (Wirkung der Salzsäure auf die Fermentssekretion des Magens und der Bauchspeicheldrüse.) R. Ehrmann and R. Lederer.
72 Determination of "Neutral" Sulphur in Urine. (Bestimmung des "neutralen" Schwefels im Harn.) L. Hess.
73 Present Status of Whooping Cough. (Gegenwärtiger Stand der Keuchhustenfrage.) G. Arnheim.
74 Relations between Immunity and Ferment Action. (Beziehungen zwischen Immunität und Fermentwirkung.) M. Krause and King.
75 Experiments with Various Derivatives of Tubercle Bacilli. Specificity of Tuberculin Reactions. A. Wolff-Eisner. Commenced in No. 30.

66. **Plastic Restoration of Outer Ear.**—Schmieden reports two cases, calling special attention to the technic followed in one case. The boy's ear had been torn off, and he cut a corresponding piece of cartilage from the costal arch and implanted it in a large skin flap with the attached base above just below the clavicle. Later this flap containing the cartilage with the skin on each side was twisted around and sutured to the stump of the ear. The pedunculated flap was held in place by immobilizing the boy's arm over his head. The technic and results are shown in four illustrations.

67. **Connection Between Adrenal System and the Kidneys.**—Reicher has been conducting experimental research which he thinks has demonstrated that the internal secretion of the adrenals and the intimate mutual relations between the adrenal system and the kidneys have an important share in the pathogenesis of many forms of nephritis.

68. **Sphincteric Proctitis.**—Strauss applies this term to a condition in which the mucosa of the sphincter passage is congested, with excoriations or ulcerations, or a tendency to bleed, and a deposit of mucus in some cases. Occasionally the neck of the ampulla is also involved. All the patients with this affection complained of itching at the anus, tenesmus, and boring or stabbing pains, sometimes preventing sleep. In one case the pain was so severe that there was reflex contraction in the gluteal muscles. Anal eczema was also frequently observed, and hemorrhoids. In many cases a cancer in the rectum had been surmised from the severity of the disturbances. There was invariably spasmodic contraction of the rectum when the finger or an instrument was introduced. He has encountered several dozen cases of this sphincteric proctitis. Treatment includes measures to keep the stools soft and to reduce the local pain with tepid sitz baths, sedative suppositories or astringents. In local treatment he prefers a 2 or 5 per cent. solution of silver nitrate, applied on a cotton swab, under control of the eye. He has also devised a special cap for the syringe which prevents the injected silver nitrate from entering beyond the sphincter canal. He precedes this cauterization with some local anesthetic. In case of eroded hemorrhoid nodules he applies the caustic in the form of a silver salve for which he has devised a salve pessary; the neck of the pessary is provided with lengthwise grooves to hold the salve. Sometimes he prefers local insufflation of a powder. He gives an illustration of the pessary, etc., and urges careful differentiating treatment of this condition. The main thing is careful procto-sigmoscopy in every case in which the patient complains of disturbances in the rectum. The results of rational treatment are excellent.

Correspondenz-Blatt für Schweizer Aerzte, Basle.

August 1, XXXVIII, No. 15, pp. 481-512.

76 Scopolamin-Morphin Anesthesia in Obstetrics. (Scopolamin Morphium-Dämmerschlaf.) R. Dietschy.

Deutsche medizinische Wochenschrift, Berlin.

July 30, XXXIV, No. 31, pp. 1357-1376.

77 *Tuberculosis of Kidney: Cases illustrating Important Points in Diagnosis. (Nierentuberkulose.) Casper.
78 Serum Diagnosis of Leprosy. (Wassermannsche Reaktion in einem Falle von Lepra.) Wechselmann and G. Meier.
79 Treatment of Septic Affections with Rectal Injection of Silver Salts. (Kollargolklysmen.) C. Seidel.
80 *Pneumococcus Stomach Affection. (Pneumococcenaffektion des Magens.) Mönter.
81 *Pyelitis and Its Relation to Menstruation. E. Scheidemandel.
82 Advantages of Pfannenstiel's Transverse Incision of Fascia. (Bedeutung des Pfannenstielschen Fascienquerschnittes.) V. Zimmermann.

77. **Diagnosis of Tuberculosis of the Kidneys.**—Casper has operated in 52 out of 100 cases of tuberculosis of the kidney with a mortality of 5 patients. In the last series of 25 he has had only one death. In 140 operations on the kidneys the only death from renal insufficiency was in a case in which he was unable to apply beforehand the usual functional tests and catheterization of the ureters. When the elimination of sugar after the phloridzin test and elimination of the indigo carmine are notably delayed, it is dubious whether the other kidney alone would prove equal to the task. He would not venture to perform nephrectomy in such a case. In a typical example described, the various tests demonstrated tuberculosis of the left kidney which he consequently removed, although others had claimed to have found tubercle bacilli in the right ureter urine. The course of the case confirmed the correctness of his diagnosis based on cystoscopy, catheterization of the ureters and the functional test. The changes noted in the urine were evidently due to a mild toxic nephritis which subsided promptly after the operation. THE JOURNAL has mentioned Völcker's indigo-carmine test or chromocystoscopy, which Casper has improved by combining it with catheterization of the ureters, thus obtaining the "chromo-ureter test," which is very instructive. He remarks, however, that the elimination of indigo-carmine is no index of the work of the kidneys, like the transformation of phloridzin into sugar, but the dye is eliminated like any other foreign substance in the blood fine enough to pass through the kidneys. It only shows how one kidney can eliminate it better than the other. The more rapidly and intensively the dye is eliminated, the better the kidney is working. In case catheterization of the ureters is impossible he tests the kidney functioning by injecting 0.01 gm. phloridzin into the muscles just before the operation. When the kidney is ready for enucleation he makes a further intramuscular injection of 0.08 gm. indigo-carmine. The kidney is then excluded from the circulation with a clamp applied to the pedicle, and the wound is covered. The bladder is then rinsed until the water runs out clear, and the urine then collecting in the bladder, coming from the other, the intact kidney, is examined for albumin, and the delay before the sugar and dye are eliminated is recorded, as well as the intensity of the elimination of the dye. This whole procedure does not require more than five minutes, as the elimination of sugar begins in sixteen minutes and of the dye in eight minutes. He has never witnessed any untoward effects from this method—these small doses of the phloridzin and indigo-carmine being absolutely harmless. This technic obviates the necessity for operating at two sittings. If the sugar appears in from sixteen to twenty minutes and the blue urine in from eight to twelve minutes, if the urine is quite blue, and if there are no more than traces of albumin, the kidney is working

promptly, and the removal of its mate is justified. He warns that palpation is liable to be misleading, as neither ureter nor kidney is necessarily enlarged in case of a tuberculous process.

80. **Pneumococcus Affection of the Stomach.**—Münter relates the particulars of a case of fatal phlegmonous gastritis produced by pneumococci in a man of 33, rather addicted to alcohol. Dieulafoy and Foulerton have reported three somewhat similar cases. The pneumococcus affection of the stomach may be primary or secondary to pneumonia or ulcerative angina. The mucosa may be mainly involved, with parenchymatous inflammation of the glands and hemorrhages, erosions in the mucosa and formation of a pseudomembrane, with necrosis of the glandular layer. In another form the submucosa may be mainly involved, with phlegmons, while the mucosa shows only moderate inflammation and is free from hemorrhages and erosions. These two forms correspond to the location of the pneumococci. In the case reported the stomach region was very protuberant and the patient was extremely restless. All the four cases terminated fatally, although the findings in one case indicated a tendency to spontaneous healing.

81. **Pyelitis in Women and Menstruation.**—Scheidemandel rejects internal measures in treatment of pyelitis. The main reliance should be on rest in bed, copious ingestion of some light diuretic tea, such as linden flower tea, thermo-compression, light diet and sedatives as needed. It has been his experience that pyelitis is much more frequent in women than in men. The temperature suddenly rises and pain develops, generally on the right side, while the finding of pus and bacteria in the urine confirms the diagnosis. After five or six days of continuous fever defervescence occurs, as in pneumonia. After a few days free from fever there is usually another milder attack on the hitherto sound side. He ascribes the pyelitis to ascending infection from the anus, generally the work of the colon bacillus. After two or three attacks the trouble is at an end; transition into the chronic form of pyelitis is rare. He calls attention to the frequent regularity of the first appearance of the pyelitis three days before the onset of the menses. The characteristic pain is not connected with the menstrual hemorrhage necessarily, but may correspond with ovulation. Even at the beginning of the first attack, catheterization of the ureter may show a latent affection of the other kidney pelvis. In sixteen cases of simple pyelitis referred to him in the last few years the diagnosis had not been correctly made in a single instance, and he believes that many cases of supposed appendicitis are in reality right pyelitis. His patients were between 25 and 45 years old, and transient complications on the part of the bladder were noted in three cases, herpes labialis in two and severe sciatica in one. The urine was free from colon bacilli on dismissal in only about half the cases. The affected kidney is sometimes more painful on pressure from the rear than from the front. If the urine is examined with the microscope more regularly, and the kidneys are palpated in all dubious affections, simple pyelitis will be found to be more frequent than is realized at present. The prognosis is favorable; surgical measures are not required except in the severest cases.

Medizinische Klinik, Berlin.

August 2, IV, No. 31, pp. 1179-1218.

83 *Practical Importance of Serum Diagnosis of Syphilis. A. Blaschko.
84 *Serum Diagnosis in Mothers of Infants with Inherited Syphilis. (Komplementfixation bei Müttern hereditärsyphilitischer Säuglinge.) W. Knoepfelmacher and H. Lehndorff.
85 *Diagnosis of Liver Affections. (Moderne Leberdiagnostik.) A. Posselt. Commenced in No. 30.
86 *Suture of Tendons. (Neue Methode der Sehnennaht.) C. Ritter.
87 Resection of Anterior Half of Eyeball after Injury. (Resektion der Vorderhälfte des Augapfels nach Verletzungen.) C. Ziem.
88 *Chorioepithelioma in a Man. M. Chuvin.
89 Percussion Hammer and Plessimeter for Threshold Percussion of the Heart. (Schwellenwertsperkussion des Herzens.) R. Lenzmann.
90 New Light on Phenomena of Mendel's Law and Atavism. (Neure Untersuchungen über Atavismus bei Bastarden.) E. Baur.
91 Etiology of Digestive Gastrosuccorrhea. (Aetiologie des digestiven Magensaftflusses.) P. Huppert.

83. **Practical Importance of Serum Diagnosis of Syphilis.**—Blaschko discusses the indications for treatment on the basis of the serum diagnosis and the prognosis. His conclusions are that to date serum diagnosis has very little practical importance. One must be very cautious in basing conclusions on it. The main thing at present is to accumulate further experiences with it.

84. **Serum Diagnosis in Mothers of Infants with Inherited Syphilis.**—Knoepfelmacher has continued his research in this line and states that positive findings were obtained in about 56.2 per cent. of 45 women, 32 of whom denied having had syphilis. The findings were positive also in 61.5 per cent. of 13 women known to have had syphilis. These findings are about in the same proportions as in known syphilities in a latent stage. They seem to demonstrate that the mothers of children with inherited syphilis have had syphilis themselves in the past.

85. **Diagnosis of Liver Affections.**—Posselt discusses in detail the modern methods of testing the functioning of the liver and throwing light on the origin of liver affections. It is evident that a large proportion of cases of gallstones are traceable to typhoid infection in the past. He mentions that Basle and Strasburg, which are noted for the prevalence of typhoid, have nearly twice as many cases of gallstones as certain other European cities, according to the official autopsy reports. Paratyphoid processes, meat poisoning and dysentery are also possible sources for the infection in the bile region responsible for cholelithiasis later, as also residence in a typhoid district. He insists on the necessity for making greater use of the biologic reactions, especially agglutination, as an aid in the diagnosis of liver affections, particularly in those due to the colon bacillus.

86. **Tendon Suture.**—Ritter reports from Payr's clinic at Greifswald some new methods of suturing tendons with the aid of a segment of a vein taken from some animal. Even when there is a quite a gap between the stumps of the tendon, good results are obtained as the new growth is confined to its proper place by the enclosing wall of the vessel cylinder. When the stumps are of uneven size he adapts the encircling cylinder to this condition by cutting it with a spiral incision, making several turns. The cylinder is then fitted to enclose the two stumps and the spiral incision is then sutured its entire length, as he shows in an illustration, reporting a clinical case in which the tendons in the thumb had been severed, leaving a large gap bridged in this way.

88. **Chorioepithelioma in a Man.**—The case reported by Chuvin from Odessa was distinguished by the predominance of the general symptoms. The existence of the primary malignant tumor in the testicle was masked by the secondary metastases simulating miliary tuberculosis. The principal symptoms were extreme dyspnea, cough and rapid and small pulse, while the heart findings were negative. The patient was a college student of a healthy family who had been ailing for six months, complaining of pains in the right side, occasional fever and cough. The primary tumor in the testicle was an autopsy surprise.

Münchener medizinische Wochenschrift.

July 28, LV, No. 30, pp. 1569-1624.

92 *Treatment of Obesity by Exclusive Milk Diet. (Entfettung durch reine Milchkuren.) F. Moritz.
93 Induration of Apex from Obstructed Nose Breathing and Its Differentiation. (Kollapsinduration der rechten Lungenspitze bei chronisch behinderter Nasenatmung.) K. Bilimek.
94 Possibility and Importance of Retrograde Lymph Current from Thoracic Duct. (Retrograden Lymphtransport im Bereich des Angulus venosus sinister.) C. Hart.
95 *Beef Serum Treatment of Gonorrheal Ophthalmia in the Newly Born. (Behandlung der Blennorrhoea neonatorum mit Rinderserum.) W. Gilbert.
96 Artificially Carbonated Baths. (Sarasonsche Oxetbäder.) E. Müller.
97 Artificial Sulphur Baths. (Künstliche Schwefelbäder.) F. Klopstock.
98 Operation and Aftertreatment of Mammary Cancer. (Brustkrebs.) Helle.
99 *Karrell's Milk Diet and Underfeeding in Failing Heart Compensation. (Karrellsche Milchkur und die Unterernährung bei Kompensationsstörungen.) F. Hirschfeld.
100 Physiology of Acclimatization. O. Loew.
101 Growth of Lactic Acid Bacilli in Stomach Content. (Wachstumsfähigkeit von Boas-Kaufmannschen Bazillen im Mageninhalt.) R. Latzel.
102 Prophylaxis of Myopia. (Kurzsichtigkeit und ihre Verhütung.) Best. Commenced in No. 29.

92. **Exclusive Milk Diet in Treatment of Obesity.**—Moritz has been delighted with his experience with this means of influencing obesity. It is the simplest and most convenient technic, he says, as well as the cheapest, while it permits individualization and makes the least demands on the patient's attention. He has found it extremely effective, as he shows by eight typical examples. The patients lost from 16 to 46 pounds in from 15 to 81 days on the exclusive milk diet, while it had a favorable influence on complications on the part of the heart and kidneys. The heart disturbances subsided and the pulse tension and rate declined. He allows from 3 to 5 pints of milk a day, in five portions: approximately a pint at breakfast time, a glass at 10 a. m., a pint at noon, another glass at 4 p. m., and a pint at 7 p. m. The milk is taken cold or warm, as desired, and up to a pint of water may be added. This technic obviates thirst and hunger, while the weight rapidly declines. Another advantage is the absence of salt from the diet. The only by-effect observed is a tendency to constipation which must be combated; occasionally there is a little headache or backache with depression if the weight declines too rapidly. He gives the tabulated findings of the metabolism for three months in one case, remarking that the conditions on the milk diet are remarkably simple and instructive. (See also abstract 116 in THE JOURNAL, June 6, page 1951.)

95. **Treatment of Ophthalmia Neonatorum with Beef Serum.**—Gilbert refers to the experiences with beef serum for local applications to suppurative processes recently reported by Müller and Moro. He states that he has applied this technic in eight cases of gonorrheal ophthalmia in newly-born children, alone or in combination with silver nitrate. The results were favorable, and he advocates its general adoption. He rinses out the eyes every two hours with the beef serum, kept on ice, fresh every twenty-four hours. It much shortens the duration of treatment according to his experience.

99. **Underfeeding in Failing Compensation.**—Hirschfeld is convinced that underfeeding is an efficient means of controlling failing compensation. This is the explanation of the efficacy of the Karell milk cure in heart disease. It is a method of underfeeding, and the same result can be accomplished with a restricted mixed diet. (See Abstract 92.)

Wiener klinische Wochenschrift.

July 30, XXI, No. 31, pp. 1169-1214.

103 *Removal of Hypophysis for Adipose-Genital Degeneration. A. v. Eiselsberg and L. v. Frankl-Hochwart.
104 *Affections of Optic Nerve in Course of Pregnancy. (Sehnervenleiden in Folge von Gravidität.) A. v. Reuss.
105 Hyperplasia of Thymus in Addison's Disease. K. Hart.
106 Colon Bacilli Infection of Respiratory Organs. (Kolibazillose der Respirationsorgane.) H. v. Schrötter and M. Weinberger. Commenced in No. 30.

August 6, No. 32, pp. 1215-1274.

107 Ocular Tuberculin Reaction. (Konjunktivale Tuberkulinreaktion.) A. Krokiewicz.
108 Diagnostic Importance of Ocular Tuberculin Reaction in General Practice. (Konjunctival-, genannt Ophthalmoreaktion.) L. Hans.
109 *Diagnostic Importance of Composition of Urine in Pneumonia. (Zusammensetzung des Harnes bei der Lungenentzündung.) E. Zak. Commenced in No. 31.
110 Impressions of a Surgeon Visiting North America. (Chirurgische Eindrücke aus Nordamerika.) P. Clairmont. Commenced in No. 31.

103. **Operations on the Hypophysis.**—This article reports two more cases of removal of a tumor in the hypophysis through the nose to improve conditions of the type called by Fröhlich "adipose-genital degeneration." The first patient, male, was operated on in June, the second in October, 1907. The symptoms in the first case were headache, amaurosis and atrophy of the optic nerve on the left side, with right hemianopsia and atrophy of the temporal half of the papilla, arrested growth, obesity and infantile genitals. The extirpated tumor was suspiciously like carcinoma. The patient has been constantly improving in every way since; he is free from headache and vertigo, while vision improved at once and permanently, and the sexual functions have become apparently normal. The latest case was that of a man of 27, very short and corpulent, no erections or trace of hair on chin and pubes, with headache for two years with brief remissions, occasional vertigo and disturbance in vision. For a time he could only count fingers at a few feet, but later was able to read with one eye. His hair was gray, but his appearance was otherwise very childlike. The tumor in the hypophysis proved to be an angiosarcoma and marked improvement followed its removal. Hochenegg has reported the successful removal of a tumor in the hypophysis in a case of acromegaly. The technic and differentiation are described in detail.

104. **Optic Disturbances from Pregnancy.**—Reuss describes a case in which the patient had visual disturbances during her latest pregnancies, amounting almost to blindness and then retrogressing after delivery. In nearly all such cases on record the trouble was a chronic retrobulbar neuritis, with central scotoma, and optic neuritis with atrophy, always with visible signs of inflammation. He reviews the literature on the subject, and suggests the possibility of abnormal size and shape of the hypophysis and sella turcica, swollen from the changes of pregnancy, as the cause of the visual disturbances, although he was unable to examine the patient with the Roentgen rays in his case.

109. **Composition of the Urine in Pneumonia.**—For years Zak has been studying the composition of the urine in pneumonia—a total of 190 cases with 449 examinations; 65 examinations of 50 febrile tuberculous patients, and 90 examinations of 43 others. The results show an almost typical composition of the urine in pneumonia. About the fifth day the findings in the urine are characteristic of croupous pneumonia: the gradual increase of albumin, of acetic acid bodies, of primary albumoses and other albumoses and of urobilin, while lime and the chlorids are much reduced. Still more characteristic is the occurrence of large numbers of coarsely granular "incrusted" tube casts. These casts are short, grayish brown, with irregular surface, and one glance in the microscope will suggest the diagnosis of pneumonia. They are stiff with incrustation with urates, and generally appear in large numbers, but only for a short time, then suddenly giving place to hyaline or other ordinary casts. This characteristic output of the incrusted casts occurs at the height of the disease. They are also observed, although less frequently and with less of this overwhelming suddenness, in sepsis, cancer, diabetes, peritonitis and articular rheumatism. The pneumonia urine findings can confirm the diagnosis of pneumonia in dubious cases, although scarcely conclusive alone.

Zeitschrift für Geburtshülfe und Gynäkologie, Stuttgart.

LXII, No. 2, pp. 177-392. Last indexed July 25, page 359.

111 Practical Advantages of Leucocyte Count for Diagnosis of Inflammatory, Gynecologic Affections. (Praktische Verwertbarkeit der Leukozytenbestimmung für die Diagnose entzündlicher Erkrankungen des weiblichen Genitale.) H. Albrecht.
112 *Behavior of Ureters After the More Comprehensive Abdominal Operations for Uterus Carcinoma. (Verhalten der Ureteren nach der erweiterten abdominalen Operation des Uteruskarzinoms.) W. Weibel.
113 *Experimental and Clinical Study of Pregnancy Tetany. (Gravidilätstetanie.) L. Adler and H. Thaler.
114 Influence of Breast Nursing on Infants in the First Few Days after Birth. (Einfluss des Selbststillens der Mütter auf die Neugeborenen in den ersten Lebenstagen.) F. Dürig.
115 Genesis of Hematosalpinx with Unilateral Hematometra. G. Schubert.
116 *What Can Be Learned from Cystoscopy in Regard to Indications and Prognosis for Abdominal Cancer Operations? (Was leistet die Cystoskopie hinsichtlich der Indikations- und Prognosenstellung der abdominalen Krebsoperation?) W. Hannes.
117 Apparent Anaplasia of Cancer Cells. (Verbrennungserscheinungen am Epithel.) K. Holzapfel.
118 Case of Gravid Rudimentary Pseudodouble Uterus. (Uterus pseudodidelphys.) R. Oerl.

112. **Behavior of Ureters After Abdominal Operation for Uterine Cancer.**—This communication issues from Wertheim's clinic and reviews the experiences in regard to the ureters with his technic for removal of cancer of the uterus. In 400 operations of the kind the ureter was injured in 24 cases, that is, in 6 per cent.: in 3 cases both ureters were injured. The injury caused necrosis with a fistula; the most critical period was the second week. Most of these fistulas healed spontaneously between the third and twelfth week, but even after the third month spontaneous healing was sometimes observed. No disturbances were evident later in the injured ureter, even after years, except that the intervals between

the contractions were somewhat longer. Conservative treatment should be the rule; if ascending infection of the kidney is observed he would advise nephrectomy, if possible. Spontaneous healing occurred in two cases of bilateral injury; the other patient was treated by implantation of both ureters in the bladder.

113. **Pregnancy Tetany.**—Adler and Thaler report a case of tetany developing during parturition and another in which it developed as the patient began to nurse her infant. They review the literature and report extensive experimental research which confirms the connection between the parathyroids and pregnancy tetany.

116. **Cystoscopy and Abdominal Cancer Operations.**—Hannes has examined 200 women with carcinoma of the cervix, using the cystoscope in a large number. He describes the important indications in respect to operation and prognosis that can be learned by this means. Especially important is his assertion that no complications on the part of the bladder during the operation need be feared when cystoscopy gives entirely negative findings. The cystoscope shows whether the vesico-cervical septum is still free from involvement and the bladder can be readily detached. Even when the cystoscope shows severe bladder changes the lesion is not necessarily inoperable.

Gazzetta degli Ospedali e delle Cliniche, Milan.

July 26, XXIX, No. 89, pp. 837-852.

119 Hygienic Care of Grain in Prophylaxis of Pellagra. (Profilassi della pellagra.) E. Ronzani.
120 *Serum Diagnosis of Syphilis with Antigens from Rabbits. (Cornea sifilitica del coniglio nella reazione del Wassermann.) F. Simonelli.
121 Individualization in Treatment of Inguinal Hernia. (Costituzione anatomica e cura radicale dell'ernia inguinale.) D'Elia Nicola.

120. **Syphilitic Cornea of the Rabbit Aid to Serum Diagnosis.**—Simonelli's research has confirmed the specific character of the lesions in the rabbit cornea produced by inoculation with human syphilitic material. He has also found that an extract of the cornea can be utilized for the serum diagnosis of syphilis. The lesion contains the pale spirochete and the antigen necessary to induce the specific reaction by fixation of the complement. The rabbit cornea may prove a convenient means of obtaining the necessary antigen, instead of the extract of syphilitic organs hitherto deemed indispensable.

Policlinico, Rome.

August 2, XV, Practical Section, No. 31, pp. 985-996.

122 The abdominal Reflex. (Riflesso addominale.) A. Baldi.

Norsk Magazin for Lægevidenskaben, Christiania.

August, LXIX, No. 8, pp. 737-832.

123 Acetonuria and Acidosis. H. C. Gelmuyden.
124 *Tumors in Hypophysis and Acromegaly. (Svulster i hypofysen og akromegali.) F. Harbitz.
125 Dislocation of the Os Magnum. (Luxatio dorsalis ossis magni carpi. P. Bull.
126 Fracture of Radius in Children. (Fractura radii hos börn.) J. Nicolaysen.

124. **Tumors in the Hypophysis and Acromegaly.**—Harbitz reports 6 cases of tumor in the hypophysis; 2 were in men 33 and 51 years old, and 4 in women between 22 and 60. The tumor was accompanied by acromegaly in only one case, but there was a history of syphilis in one woman, and the man of 51 had diabetes insipidus. The reports are all postmortem findings, although the clinical course is also given. Josefson of Stockholm has reported 4 cases of hypophysis tumor, none accompanied by acromegaly, and Berner has reported a case accompanied by diabetes insipidus but no acromegaly, and about 40 or 50 cases of hypophysis tumor without acromegaly are on record. Impotence and amenorrhea were occasionally noted. There is still enough evidence, however, Harbitz declares, to show a certain causal connection between acromegaly and abnormal conditions in the hypophysis and possibly also in other organs, especially the thyroid. Acromegaly should not be regarded as a direct consequence of a tumor in the hypophysis. Its real cause should be sought deeper than this, probably in some constitutional weakness, with abnormal conditions in a whole series of organs with an internal secretion which may manifest itself in some individuals in a pathologic outgrowth.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

PATHOLOGIC TECHNIC. By Frank Burr Mallory, A.M., M.D., Associate Professor of Pathology, Harvard University Medical School, and James Homer Wright, A.M., M.D., S.D., Director of the Pathologic Laboratory of the Massachusetts General Hospital. Fourth Edition. Cloth. Pp. 480, with illustrations. Price, $3.00 Philadelphia: W. B. Saunders Co., 1908.

PULSATING EXOPHTHALMOS. By George E. de Schweinitz, M.D., Professor of Ophthalmology in the University of Pennsylvania, and Thomas B. Holloway, M.D., Instructor in Ophthalmology in the University of Pennsylvania. Cloth. Pp. 124. Price, $2.00. Philadelphia: W. B. Saunders Co., 1908.

ESTIMATION OF THE RENAL FUNCTION IN URINARY SURGERY. By J. W. Thomson Walker, M.B., C.M. (Edin.), F.R.C.S., Hunterian Professor of Surgery and Pathology, Royal College of Surgeons of England. Cloth. Pp. 273, with illustrations. London: Cassell & Co., 1908.

PRINCIPLES AND PRACTICE OF GYNECOLOGY. By E. C. Dudley, A.M., M.D., Professor of Gynecology, Northwestern University Medical School. Fifth Edition. Cloth. Pp. 805, with illustrations. Price, $5.00. Philadelphia: Lea & Febiger, 1908.

DISEASES OF THE SKIN. By George Thomas Jackson, M.D., Professor of Dermatology, College of Physicians and Surgeons, New York. Cloth. Pp. 737, with illustrations. Sixth Edition. Price, $3.00. Philadelphia: Lea & Febiger.

SIXTEENTH AND SEVENTEENTH ANNUAL REPORTS OF THE ST. JOSEPH'S HOSPITAL, Yonkers, N. Y. Under the Charge of the Sisters of Charity. Oct. 1, 1905, to Sept. 30, 1907. Paper. Pp. 81.

ARSENIC GAS POISONING. By John Glaister, Doctor of Medicine of the University of Glasgow. Cloth. Pp. 279, with illustrations. Price, $1.25. Edinburgh: E. & S. Livingstone, 1908.

CHOLECYSTO-PANCRÉATITE. Essai de Pathogénie, by Le Docteur Reine Maugeret, Ancien Interne des Hôpitaux de Paris. Paper. Pp. 149, with illustrations. Paris: G. Steinheil, 1908.

TRANSACTIONS OF THE INTERNATIONAL MEDICAL ASSOCIATION OF MEXICO. Third Annual Session, held at Monterey, N. M. Paper. Pp. 66. Monterey: American Printing Co., 1908.

TRANSACTIONS OF THE NEW HAMPSHIRE MEDICAL SOCIETY. 117th Anniversary, Held at Concord, May, 1908. Cloth. Pp. 328. Concord: Ira C. Evans Co., 1908.

NINETEENTH ANNUAL REPORT OF THE NEW AMSTERDAM EYE AND EAR HOSPITAL. For the Year 1907. Paper. Pp. 30. New York: Press of W. N. Jennings, 1907.

REPORT OF THE COLLIS P. HUNTINGTON FUND FOR CANCER RESEARCH OF THE GENERAL MEMORIAL HOSPITAL. Vol. II. Paper. New York City, 1908.

TWENTY-SECOND ANNUAL REPORTS OF THE DANBURY HOSPITAL, Danbury, Conn. 1907. Paper. Pp. 33. Danbury: News, Book and Job Print., 1907.

AKUT APPENDICIT OG DENS KIRURGISKE BEHANDLING. By Dr. P. Bull. Paper. Pp. 145. Christiania: Steen'ske Bogtrykkeri, 1908.

STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. Reprints. Vol. viii. Paper. Pp. 453, with illustrations.

ANNUAL REPORT of the Hospital Association of the City of Schenectady, 1907. Paper. Pp. 44.

NEW PATENTS.

Recent patents of interest to physicians:

894237. Spirometer. J. A. Morris, Atlanta, Ga.
894758. Inspirator. C. F. Starre, Portland, Ore.
894764. Preparing arsenic trioxid. U. Wedge, Ardmore, Pa.
895141. Apparatus for applying medicinal washes to the nasal cavity. E. S. Antisdale, Chicago.
895145. Corn and bunion plaster. P. S. Bauer, Chicago.
894818. Electrode for the evolution of ozone from oxygen or atmospheric air. J. R. Craig, Jr., London, Eng.
895295. Wrinkle-eradicator. F. A. Paris, New York.
894917. Powder-dividing and capsule-filling apparatus. L. G. Taylor, Kansas City.
895316. Preparing nitrils of aromatic alpha-oxyacids. J. L. Turner, Philadelphia, and C. E. Vanderkleed, Collingswood, N. J.
895221. Disinfecting apparatus. V. A. Williams, Sedalia, Mo.
894929. Surgical appliance. W. C. Yates, Lemoore, Cal.
895539. Arch and ankle support. L. J. Courteau, Brockton, Mass.
895852. Urinary apparatus. D. Girouard, Leominster, Mass.
895478. Radium preparation. H. Lieber, New York.
895505. Vibratory massage apparatus. V. Sence, New York.
895510. Hospital nightgown. E. Snellenburg, Philadelphia.
895812. Bottle or receptacle for liquids for medical and other uses. F. Strauss, Milwaukee, Wis.
895919. Medical cabinet. J. S. Walles, Mystic, Iowa.
895906. Respirometer. A. G. Warde, Minneapolis.
896505. Apparatus for massaging the vaginal walls, etc. J. E. Ament, Indiana, Pa.
896432. Tray for instruments. C. F. Booth, Canandaigua, N. Y.
896538. Head and face steamer. R. M. Henry and W. Hester, Indianapolis.
896114. Orthopedic apparatus. J. Jacobson, Brooklyn.
896647. Hair tonic. S. R. Mackay, Cape Breton, N. S., Canada.
896409. Antiseptic cone. G. C. McMurtry, Los Angeles, Cal.
896583. Abdominal supporter. L. Ross, Watertown, Mass.
896338. Combined tweezers and blackhead remover. A. L. Tolman, Orange, Mass.
896179. Invalid bed. U. G. Vance and R. Critser, Lanel, Ind.
896674. Surgical splint. C. A. Walker, Louisville, Ohio.